International Journal of Agriculture Extension and Social Development

A study of marketing cost, marketing margin, price spread and marketing efficiency for different channels of potato in Gujarat

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Abstract
This study investigates the marketing efficiency and value chain dynamics of potato production in Gujarat, focusing on processed products such as French fries, chips, flakes, and aloo tikki. Utilizing multistage sampling, data was gathered from 200 contract farmers, intermediaries, and processors. The research aimed to assess marketing costs, margins, price spread, and efficiency across eight identified marketing channels. Findings revealed that potato marketing in Gujarat is characterized by significant inefficiencies, with producers retaining a small share of the final consumer price, often below 10 percent. High marketing costs arise from labour-intensive processes, inadequate cold chain infrastructure, and reliance on multiple intermediaries. Channels involving processed products, particularly flakes and aloo tikki, exhibit the highest costs and lowest producer benefits due to the complexity of operations and logistical challenges. Conversely, channels for chips demonstrated relatively higher marketing efficiency. The study underscores the critical need for streamlining the potato supply chain through enhanced cold storage, efficient transportation systems, and reduced intermediary involvement. Promoting direct market access and implementing transparent pricing mechanisms can boost producers' profitability and encourage sustainable practices. These improvements would not only enhance the livelihood of farmers but also strengthen Gujarat's potato value chain, contributing to the broader agricultural economy. The findings have implications for policy-making and strategic planning in agricultural marketing systems.

Keywords: Potato, contract farming, value added products, marketing cost & margin, price spread, modified measures of marketing efficiency

Introduction

The potato (*Solanum tuberosum* L.) is the world's third most important food crop, following wheat and rice. A greater proportion of potatoes is directly edible compared to these staples, and it boasts higher production per hectare. This, combined with its nutritional value, highlights its significance and explains the continuous growth in potato cultivation. In India, potatoes have been cultivated for over 300 years and are a rich source of carbohydrates, proteins, minerals, and vitamins. Nutritionally, potatoes contain 22.6 percent carbohydrates, 1.6 percent protein, 0.1 percent fat, 0.4 percent crude fiber and provide approximately 97 kcal of energy (National Horticulture Board, 2019) [1]. Potatoes constitute the largest share of the country's vegetable production, making up a significant portion of the 28 percent total vegetable output, followed by tomatoes, onions and brinjals. (Department of Agriculture & Farmers Welfare, 2021) [2]. Potato cultivation in India occurs primarily in two seasons: *rabi* and *kharif*. The *rabi* season, from October to March, is the main growing period for potatoes. More than 80 percent of the potato crop is raised in this season. During this season, the cooler temperatures and shorter days are ideal for tuber formation, leading to higher yields and better-quality produce. The growing season can vary from 90 to 120 days, depending on the variety and climatic conditions. Main potato-growing districts in Gujarat include Banaskantha, Aravalli, Sabarkantha, Gandhinagar and Mehsana. Banaskantha is the leading potato-producing district in Gujarat, accounting for a substantial share of the state's output. The district's favourable agro-climatic conditions and well-developed irrigation infrastructure, particularly from the Sardar Sarovar Project, support high potato yields and good quality produce. Banaskantha has the largest area under potato cultivation (53548 hectare) among all potato-producing districts, with a production of 1579666 metric ton and a productivity of 29.50 MT/ha (Director of Horticulture, Government of Gujarat, 2023) [3].

The global contribution of agriculture to gross domestic product (GDP) has declined as non-agricultural activities have taken precedence. However, this shift is anticipated to support overall GDP growth. Despite its relatively smaller economic contribution, agriculture remains vital in the agro-industry value chain and the sustainable use of natural resources. Indian agriculture has witnessed significant growth over time, yet its export supply chain faces challenges such as fragmented markets, seasonal fluctuations, diversity, and environmental changes. Key issues include the prevalence of small and marginal farmers, fragmented supply chains, limited processing, and inadequate marketing infrastructure. Given the dependency of the Indian economy on agriculture, there is a pressing

need to develop effective supply chain models to enhance efficiency and improve shelf life. Effective supply chain models in agriculture help reduce losses and wastages in fruits and vegetables, ultimately boosting farmer incomes, enhancing livelihoods, and generating employment opportunities for local communities. These improvements contribute to the overall growth of the Indian economy. The commercial value of vegetables has grown significantly due to their roles in direct consumption, processing, and trade. From an economic perspective, horticultural products have gained importance, while the labour-intensive nature of vegetable production further underscores their significance as a source of employment.

An efficient agricultural marketing system is vital for ensuring that farmers receive fair returns for their produce, ultimately improving their living standards. However, the current supply chain connecting farmers to both organized and unorganized retail remains highly inefficient, characterized by numerous intermediaries and extensive manual handling. Significant post-harvest losses occur due to inadequate packaging, lack of temperature-controlled transportation, absence of cold chain facilities, and insufficient market information. Additionally, price volatility, market malpractices, wide price spreads, limited extension services, and unfavourable government policies exacerbate the inefficiencies. These factors, combined with inadequate processing, lead to substantial national losses in agricultural produce.

The primary objectives of the study were to evaluate the marketing costs and margins of various intermediaries involved in potato marketing across different channels. Additionally, it aimed to analyze the price spread, marketing efficiency, and the producer's share in the consumer's rupee within these marketing channels.

Methodology
The present study was taken out in Gujarat State. Gujarat state comprises of 33 districts. Out of 33 districts top five districts with highest area and production of potato were selected. Banaskantha, Sabarkantha, Aravalli, Gandhinagar and Mehsana are the major potato producing districts. A multistage sampling was adopted as appropriate sampling procedure for the study. A list of talukas of these five districts was prepared with cultivation area and production. Ten respondents from each selected village were taken randomly from those who were engaged in contract farming of potato. A total of 200 contract farmers were selected for the study, consisting of 42 small (up to 2 ha) farmers, 66 medium (2 to 4 ha) farmers and 92 large (above 4 ha) farmers. The marketing channels for potatoes were analyzed based on the major products derived from potatoes and their respective market coverage. A random sample of intermediaries, including five traders, five wholesalers and five retailers was surveyed. Additionally, ten organized processors involved in producing major potato-based products were selected. The analysis employed simple and weighted averages, along with percentage methods for tabular data interpretation. Further evaluation to address the specific objectives was conducted using various standard statistical tools. A brief description of the different analytical procedures like marketing cost, marketing margin, price spread and marketing efficiency are presented below:

Marketing Cost
It is the total cost incurred on marketing either in cash of in kind by the producer and on various intermediaries involved in the movement of potatoes till it reaches the ultimate consumer. It was calculated as follow:

$$C = C_f + C_{m1} + C_{m2} + C_{m3} + ... + C_{mi}$$

Where,
C = Total cost of marketing of the commodity;
C_f = Cost paid by the producer from the time the produce leaves the farm till sells
C_{mi} = Cost incurred by the ith middleman in the process of buying and selling of the product

Marketing Margin
It is the difference between the total payments (Cost + Purchase Price) and receipts (Sale Price) of the middlemen. It was calculated as follow:

$$A_{mi} = P_{Ri} - (P_{pi} + C_{mi})$$

Where,
P_{Ri} = Sale price
P_{pi} = Purchase price
C_{mi} = Cost incurred in marketing

Price Spread
Price spread is the difference between the price paid by the consumer and that received by the producer of commodity.

$$PS = RP - PNP$$

Where,
PS = Price spread
RP = Price paid by consumer
PNP = Net price received by producer

Modified Measures of Marketing Efficiency
Marketing efficiency is the ratio of the total value of goods marketed to the total marketing cost. The higher the ratio, higher is the efficiency. The marketing efficiency was worked out using Acharya - Agarwal modified marketing efficiency method which is as follows:

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

Where,
MME = Modified Measures of Marketing Efficiency
FP = Price received by farmer
MC = Total marketing cost
MM = Total marketing margin

Results and Discussion
Majority of farmers (178) preferred processors to sell their produce. Although, all concerned farmers were contract farmers it was found that some farmers were selling their produce to traders as well. The total quantity sold to traders

was 67887.48 quintals and average price received by farmers from was 1407.60 ₹/q. The total quantity sold to processors was 523770.29 quintals and average price received by farmers was 2557.46 ₹/q. Table 1 displays major marketing channels found in the study area. There were eight major marketing channels of potato. The channels were identified for the four major products of potato: french fries, chips, flakes and aloo tikki. In, channel I and II the end product was french fries, in channel III and IV the end product was chips, in channel V and VI the end product was flakes and in channel VII and VIII the end product was aloo tikki.

Table 1: Marketing channels of potato

Channel No.	Marketing channel	Form of use of the product
I	Producer – Processor – Restaurant	French fries
II	Producer – Processor – Exporter	French fries
III	Producer – Processor – Wholesaler – Retailer – Consumer	Chips
IV	Producer – Trader – Processor – Wholesaler – Retailer – Consumer	Chips
V	Producer – Secondary Processor – Tertiary Processor – Restaurant	Flakes
VI	Producer – Processor – Exporter	Flakes
VII	Producer – Processor – Restaurant	Aloo tikki
VIII	Producer – Processor – Exporter	Aloo tikki

Marketing cost, marketing margin and price spread of channel I

Table 2 provides a detailed breakdown of costs, margins and price spread across different stakeholders of the marketing channel I in the study area. It highlights the disparities between the net price received by producers and the price paid by consumers, along with the cost components and marketing margins at each stage. Channel I included producer, processor and restaurant. Marketing cost for producer, and processor was 18.90 and 8295.10 ₹/q. Thus, total marketing cost for channel I was 8314.00 ₹/q.

Marketing cost of producer included cost of grading-packing (10.00 ₹/q) and loss (8.90 ₹/q).

Marketing cost of processor included cost of packing material (16.00 ₹/q), loading and unloading (6.00 ₹/q), transportation (50.00 ₹/q), weighing (8.90 ₹/q), storage (250.00 ₹/q), loss (4.36 ₹/q), operational cost (2510.77 ₹/q), labour (1345.42 ₹/q), electricity (2326.86 ₹/q), packing material (144.39 ₹/q) and other cost (1632.40 ₹/q). Other cost included the cost of transport and storage of the product.

Total marketing margin of channel I was 11113.17 ₹/q. Price spread was 19427.17 ₹/q. Net price received by producer was 1405.35 ₹/q, producer's share in consumer rupee was 6.75 percent and purchase price of consumer was 20832.52 ₹/q.

Table 2: Marketing cost, marketing margin and price spread of channel I

Particular	Cost (₹/q)	% to consumer price
Net price received by producer	1405.35	6.75
Cost incurred by producer		
Grading and packing	10.00	0.05
Loss	8.90	0.04
Total cost	18.90	0.09
Sale price of producer/Purchase price of processor	1424. 25	6.84
Cost incurred by processor		
Packing material	16.00	0.08
Loading and unloading	6.00	0.03
Transportation	50.00	0.24
Weighing	8.90	0.04
Storage	250.00	1.20
Loss	4.36	0.02
Operational cost	2510.77	12.05
Labour	1345.42	6.46
Electricity	2326.86	11.17
Packaging material	144.39	0.69
Other cost	1632.40	7.84
Marketing cost	8295.10	39.82
Marketing margin	12537.42	53.35
Price paid by consumer	20832.52	100.00
Net price received by producer	1405.35	6.75
Total marketing cost	8314.00	39.91
Total marketing margin	11113.17	53.35
Price spread	19427.17	93.25

Marketing cost, marketing margin and price spread of channel II

Table 3 provides a detailed breakdown of costs, margins and price spread across different stakeholders of the marketing channel II in the study area. It highlights the disparities between the net price received by producers and the price

paid by consumers, along with the cost components and marketing margins at each stage. Channel II included producer, processor and exporter. Marketing cost for producer and processor was 18.90 ₹/q and 8295.10 ₹/q. Thus, total marketing cost for channel II was 8314.00 ₹/q.

Marketing cost of producer included cost of grading-packing (10.00 ₹/q) and loss (8.90 ₹/q).

Marketing cost of processor included cost of packing material (16.00 ₹/q), loading and unloading (6.00 ₹/q), transportation (50.00 ₹/q), weighing (8.90 ₹/q), storage (250.00 ₹/q), loss (4.36 ₹/q), operational cost (2510.77 ₹/q), labour (1345.42 ₹/q), electricity (2326.86 ₹/q), packing material (144.39 ₹/q) and other cost (1632.40 ₹/q). Other cost included the cost of transport and storage of the product.

Total marketing margin of channel II was 4280.55 ₹/q. Price spread was 12594.65 ₹/q. Net price received by producer was 1405.35 ₹/q, producer's share in consumer rupee was 10.04 percent and purchase price of consumer was 14000.00 ₹/q.

Table 3: Marketing cost, marketing margin and price spread of channel II

Particular	Cost (₹/q)	% to consumer price
Net price received by producer	1405.35	10.04
Cost incurred by producer		
Grading and packing	10.00	0.07
Loss	8.90	0.06
Total cost	18.90	0.14
Sale price of producer/Purchase price of processor	1424. 25	10.17
Cost incurred by processor		
Packing material	16.00	0.11
Loading and unloading	6.00	0.04
Transportation	50.00	0.36
Weighing	8.90	0.06
Storage	250.00	1.79
Loss	4.36	0.03
Operational cost	2510.77	17.93
Labour	1345.42	9.61
Electricity	2326.86	16.62
Packaging material	144.39	1.03
Other cost	1632.40	11.66
Marketing cost	8295.10	59.25
Marketing margin	4280.65	30.58
Sale price of processor/Purchase price of exporter	14000.00	100.00
Net price received by producer	1405.35	10.04
Total marketing cost	8314.00	59.39
Total marketing margin	4280.55	30.58
Price spread	12594.65	89.96

Marketing cost, marketing margin and price spread of channel III

Table 4 provides a detailed breakdown of costs, margins and price spread across different stakeholders of the marketing channel III in the study area. It highlights the disparities between the net price received by producers and the price paid by consumers, along with the cost components and marketing margins at each stage. Channel III included producer, processor, wholesaler, retailer and consumer. Marketing cost for producer and processor, wholesaler and retailer were 22.07 ₹/q, 2028.32 ₹/q, 18.94 ₹/q and 12.82 ₹/q. Thus, total marketing cost for channel III was 2082.15 ₹/q.

Marketing cost of producer included cost of grading-packing (12.00 ₹/q) and loss (10.07 ₹/q).

Marketing cost of processor included cost of packing material (14.00 ₹/q), loading-unloading (8.00 ₹/q), transportation (30.00 ₹/q), weighing (7.30 ₹/q), storage (220.00 ₹/q), loss (6.79 ₹/q), operational cost (529.33 ₹/q), labour (352.68 ₹/q), electricity (818.89 ₹/q), packing material (18.82 ₹/q) and other cost (22.51 ₹/q). Other cost included the cost of transport and storage of the product.

Marketing cost of wholesaler included transportation (4.70 ₹/q), loading-unloading (6.24 ₹/q) and storage (8.00 ₹/q).

Marketing cost of retailer included transportation (3.20 ₹/q), loading-unloading (3.92 ₹/q) and storage (5.70 ₹/q).

Total marketing margin of channel III was 265.07 ₹/q. Price spread was 2347.22 ₹/q. Net price received by producer was 1282.97 ₹/q, producer's share in consumer rupee was 35.34 percent and purchase price of consumer was 3630.19 ₹/q.

Table 4: Marketing cost, marketing margin and price spread of channel III

Particular	Cost (₹/q)	% to consumer price
Net price received by producer	1282.97	35.34
Cost incurred by producer		
Grading and packing	12.00	0.33
Loss	10.07	0.28
Total cost	22.07	0.61
Sale price of producer/Purchase price of processor	1305.04	35.95
Cost incurred by processor		
Packing material	14.00	0.39
Loading and unloading	8.00	0.22
Transportation	30.00	0.83
Weighing	7.30	0.20
Storage	220.00	6.06
Loss	6.79	0.19
Operational cost	529.33	14.58
Labour	352.68	9.72
Electricity	818.89	22.56
Packaging material	18.82	0.52
Other cost	22.51	0.62
Marketing cost	2028.32	55.87
Marketing margin	229.23	6.31
Sale price of processor/Purchase price of wholesaler	3562.59	98.14
Cost incurred by wholesaler		
Transportation	4.70	0.13
Loading and unloading	6.24	0.17
Storage	8.00	0.22
Marketing cost	18.94	0.52
Marketing margin	26.89	0.74
Sale price of wholesaler/Purchase price of retailer	3608.42	99.40
Cost incurred by retailer		
Transportation	3.20	0.09
Loading and unloading	3.92	0.11
Storage	5.70	0.16
Marketing cost	12.82	0.35
Marketing margin	8.95	0.25
Price paid by consumer	3630.19	100.00
Net price received by producer	1282.97	35.34
Total marketing cost	2082.15	57.36
Total marketing margin	265.07	7.30
Price spread	2347.22	64.66

Marketing cost, marketing margin and price spread of channel IV

Table 5 provides a detailed breakdown of costs, margins and price spread across different stakeholders of the marketing channel IV in the study area. It highlights the disparities between the net price received by producers and the price paid by consumers, along with the cost components and marketing margins at each stage. Channel IV included producer, trader, processor, wholesaler, retailer and consumer. Marketing cost for producer and processor, trader, wholesaler and retailer were 21.01 ₹/q, 465.45 ₹/q, 1578.20 ₹/q, 12.94 ₹/q and 9.04 ₹/q. Thus, total marketing cost for channel IV was 2105.15 ₹/q.

Marketing cost of producer included cost of grading-packing (12.00 ₹/q) and loss (9.01 ₹/q).

Marketing cost of trader included packing material (8.00 ₹/q), loading-unloading (12.56 ₹/q), transportation (25.80 ₹/q), weighing (6.30 ₹/q), storage (370.00 ₹/q) and loss (42.79 ₹/q).

Marketing cost of processor included cost of loading-unloading (16.00 ₹/q), transportation (30.00 ₹/q), weighing (7.30 ₹/q), storage (220.00 ₹/q), loss (19.24 ₹/q), operational cost (417.53 ₹/q), labour (352.68 ₹/q), electricity (474.12 ₹/q), packaging material (18.82 ₹/q) and other cost (22.51 ₹/q). Other cost included the cost of transport and storage of the product.

Marketing cost of wholesaler included transportation (4.70 ₹/q), loading-unloading (3.24 ₹/q) and storage (2.00 ₹/q).

Marketing cost of retailer included transportation (3.30 ₹/q), loading-unloading (2.00 ₹/q) and storage (3.74 ₹/q).

Total marketing margin of channel IV was 258.68 ₹/q. Price spread was 2363.83 ₹/q. Net price received by producer was 1282.97 ₹/q, producer's share in consumer rupee was 35.34 percent and purchase price of consumer was 3630.22 ₹/q.

Table 5: Marketing cost, marketing margin and price spread of channel IV

Particular	Cost (₹/q)	% to consumer price
Net price received by producer	1282.97	35.34
Cost incurred by producer		
Grading and packing	12.00	0.33
Loss	9.01	0.28
Total cost	21.01	0.61
Sale price of producer/Purchase price of trader	1303.98	35.95
Cost incurred by trader		
Packing material	8.00	0.22
Loading and unloading	12.56	0.35
Transportation	25.80	0.71
Weighing	6.30	0.17
Storage	370.00	10.19
Loss	42.79	1.18
Marketing cost	465.45	12.82
Marketing margin	97.39	2.68
Sale price of trader/Purchase price of processor	1866.82	51.42
Cost incurred by processor		
Loading and unloading	16.00	0.44
Transportation	30.00	0.83
Weighing	7.30	0.20
Storage	220.00	6.06
Loss	19.24	0.53
Operational cost	417.53	11.50
Labour	352.68	9.72
Electricity	474.12	13.06
Packaging material	18.82	0.52
Other cost	22.51	0.62
Marketing cost	1578.20	43.47
Marketing margin	141.32	3.89
Sale price of processor/Purchase price of wholesaler	3586.34	98.79
Cost incurred by wholesaler		
Transportation	4.70	0.13
Loading and unloading	3.24	0.09
Storage	2.00	0.06
Marketing cost	12.94	0.36
Marketing margin	16.12	0.44
Sale price of wholesaler/Purchase price of retailer	3615.40	99.59
Cost incurred by retailer		
Transportation	3.30	0.09
Loading and unloading	2.00	0.06
Storage	3.74	0.10
Marketing cost	9.04	0.25
Marketing margin	5.78	0.16
Price paid by consumer	3630.22	100.00
Net price received by producer	1282.97	35.34
Total marketing cost	2105.15	57.99
Total marketing margin	258.68	7.13
Price spread	2363.83	65.12

Marketing cost, marketing margin and price spread of channel V

Table 6 provides a detailed breakdown of costs, margins and price spread across different stakeholders of the marketing channel V in the study area. It highlights the disparities between the net price received by producers and the price paid by consumers, along with the cost components and marketing margins at each stage. Channel V included producer, secondary processor, tertiary processor and restaurant. Marketing cost for producer, secondary processor and tertiary processor was 18.90, 9239.78 and 5803.08 ₹/q. Thus, total marketing cost for channel V was 15061.76 ₹/q.

Marketing cost of producer included cost of grading-packing (14.00 ₹/q) and loss (8.90 ₹/q).

Marketing cost of secondary processor included cost of packing material (16.00 ₹/q), loading and unloading (6.00 ₹/q), transportation (50.00 ₹/q), weighing (8.90 ₹/q), storage (250.00 ₹/q), loss (4.36 ₹/q), operational cost (2510.77 ₹/q), labour (1345.42 ₹/q), electricity (2326.86 ₹/q), packing material (144.39 ₹/q) and other cost (1632.40 ₹/q). Other cost included the cost of transport and storage of the product.

Marketing cost of tertiary processor included cost of transportation (56.70 ₹/q), loading and unloading (8.10 ₹/q), storage (178.38 ₹/q), loss (4.36 ₹/q), operational cost

(2818.12 ₹/q), labour (812.33 ₹/q), electricity (856.72 ₹/q), packing material (16.12 ₹/q) and other cost (1056.61 ₹/q). Other cost included the cost of transport and storage of the product.

Total marketing margin of channel V was 7933.48 ₹/q. Price spread was 22995.24 ₹/q. Net price received by producer was 921.78 ₹/q, producer's share in consumer rupee was 3.25 percent and purchase price of consumer was 23921.02 ₹/q.

Table 6: Marketing cost, marketing margin and price spread of channel V

Particular	Cost (₹/q)	% to consumer price
Net price received by producer	921.78	3.85
Cost incurred by producer		
Grading and packing	14.00	0.06
Loss	8.90	0.04
Total cost	18.90	0.08
Sale price of producer/Purchase price of processor	944.68	3.95
Cost incurred by secondary processor		
Packing material	16.00	0.07
Loading and unloading	6.00	0.03
Transportation	50.00	0.21
Weighing	8.90	0.04
Storage	250.00	1.05
Loss	4.36	0.02
Operational cost	2510.77	10.50
Labour	1345.42	5.62
Electricity	2326.86	9.73
Packaging material	144.39	0.60
Other cost	1632.40	6.82
Marketing cost	9239.78	38.63
Marketing margin	5760.22	24.08
Sale price of secondary processor/Purchase price of tertiary processor	15944.68	66.66
Cost incurred by tertiary processor		
Transportation	56.70	0.24
Loading and unloading	8.10	0.03
Storage	178.38	0.75
Operational cost	2818.12	11.78
Labour	812.33	3.40
Electricity	856.72	3.58
Packaging material	16.12	0.07
Other cost	1056.61	4.42
Marketing cost	5803.08	24.26
Marketing margin	2173.26	9.09
Price paid by consumer	23921.02	100.00
Net price received by producer	921.78	3.25
Total marketing cost	15061.76	62.96
Total marketing margin	7933.48	33.17
Price spread	22995.24	96.13

Marketing cost, marketing margin and price spread of channel VI

Table 7 provides a detailed breakdown of costs, margins and price spread across different stakeholders of the marketing channel VI in the study area. It highlights the disparities between the net price received by producers and the price paid by consumers, along with the cost components and marketing margins at each stage. Channel VI included producer, processor and exporter. Marketing cost for producer and processor was 18.90 ₹/q and 9239.78 ₹/q. Thus, total marketing cost for channel VI 9258.68 was ₹/q.

Marketing cost of producer included cost of grading-packing (14.00 ₹/q) and loss (8.90 ₹/q).

Marketing cost of processor included cost of packing material (16.00 ₹/q), loading and unloading (6.00 ₹/q), transportation (50.00 ₹/q), weighing (8.90 ₹/q), storage (250.00 ₹/q), loss (4.36 ₹/q), operational cost (2510.77 ₹/q), labour (1345.42 ₹/q), electricity (2326.86 ₹/q), packing material (144.39 ₹/q) and other cost (1632.40 ₹/q). Other cost included the cost of transport and storage of the product.

Total marketing margin of channel VI was 4272.53 ₹/q. Price spread was 13531.21 ₹/q. Net price received by producer was 921.78 ₹/q, producer's share in consumer rupee was 5.78 percent and purchase price of consumer was 15944.68 ₹/q.

Table 7: Marketing cost, marketing margin and price spread of channel VI

Particular	Cost (₹/q)	% to consumer price
Net price received by producer	921.78	5.78
Cost incurred by producer		
Grading and packing	14.00	0.09
Loss	8.90	0.06
Total cost	18.90	0.12
Sale price of producer/Purchase price of processor	944.68	5.92
Cost incurred by processor		
Packing material	16.00	0.10
Loading and unloading	6.00	0.04
Transportation	50.00	0.31
Weighing	8.90	0.06
Storage	250.00	1.57
Loss	4.36	0.03
Operational cost	2510.77	15.75
Labour	1345.42	8.44
Electricity	2326.86	14.59
Packaging material	144.39	0.91
Other cost	1632.40	10.24
Marketing cost	9239.78	57.95
Marketing margin	5760.22	36.13
Sale price of processor/Purchase price of exporter	15944.68	100.00
Net price received by producer	921.78	5.78
Total marketing cost	9258.68	58.07
Total marketing margin	4272.53	26.80
Price spread	13531.21	84.86

Marketing cost, marketing margin and price spread of channel VII

Table 8 provides a detailed breakdown of costs, margins and price spread across different stakeholders of the marketing channel VII in the study area. It highlights the disparities between the net price received by producers and the price paid by consumers, along with the cost components and marketing margins at each stage. Channel VII included producer, processor and restaurant. Marketing cost for producer and processor was 18.90 and 10521.24 ₹/q. Thus, total marketing cost for channel VII was 10540.14 ₹/q.

Marketing cost of producer included cost of grading-

packing (10.00 ₹/q) and loss (8.90 ₹/q).

Marketing cost of processor included cost of packing material (16.00 ₹/q), loading and unloading (6.00 ₹/q), transportation (50.00 ₹/q), weighing (8.90 ₹/q), storage (250.00 ₹/q), loss (4.36 ₹/q), operational cost (3217.21 ₹/q), labour (1819.60 ₹/q), electricity (2786.92 ₹/q), packing material (144.39 ₹/q) and other cost (2218.16 ₹/q). Other cost included the cost of transport and storage of the product.

Total marketing margin of channel VII was 9878.12 ₹/q. Price spread was 20418.26 ₹/q. Net price received by producer was 933.62 ₹/q, producer's share in consumer rupee was 4.37 percent and purchase price of consumer was 21351.88 ₹/q.

Table 8: Marketing cost, marketing margin and price spread of channel VII

Particular	Cost (₹/q)	% to consumer price
Net price received by producer	933.62	4.37
Cost incurred by producer		
Grading and packing	10.00	0.05
Loss	8.90	0.04
Total cost	18.90	0.09
Sale price of producer/Purchase price of processor	952.52	4.46
Cost incurred by processor		
Packing material	16.00	0.07
Loading and unloading	6.00	0.03
Transportation	50.00	0.23
Weighing	8.90	0.04
Storage	250.00	1.17
Loss	4.36	0.02
Operational cost	3217.21	15.07
Labour	1819.60	8.52
Electricity	2786.92	13.05
Packaging material	144.39	0.68
Other cost	2218.16	10.39
Marketing cost	10521.24	49.28
Marketing margin	9878.12	46.26
Price paid by consumer	21351.88	100.00
Net price received by producer	933.62	4.37
Total marketing cost	10540.14	49.36
Total marketing margin	9878.12	46.26
Price spread	20418.26	95.63

Marketing cost, marketing margin and price spread of channel VIII

Table 9 provides a detailed breakdown of costs, margins and price spread across different stakeholders of the marketing channel VIII in the study area. It highlights the disparities between the net price received by producers and the price paid by consumers, along with the cost components and marketing margins at each stage. Channel VIII included producer, processor and exporter. Marketing cost for producer and processor was 18.90 ₹/q and 10521.24 ₹/q. Thus, total marketing cost for channel VIII was 10540.14 ₹/q.

Marketing cost of producer included cost of grading-packing (10.00 ₹/q) and loss (8.90 ₹/q).

Marketing cost of processor included cost of packing material (16.00 ₹/q), loading and unloading (6.00 ₹/q), transportation (50.00 ₹/q), weighing (8.90 ₹/q), storage (250.00 ₹/q), loss (4.36 ₹/q), operational cost (3217.21 ₹/q), labour (1819.60 ₹/q), electricity (2786.92 ₹/q), packing

material (144.39 ₹/q) and other cost (2218.16 ₹/q). Other cost included the cost of transport and storage of the product.

Total marketing margin of channel VIII was 4730.53 ₹/q. Price spread was 15270.67 ₹/q. Net price received by producer was 933.62 ₹/q, producer's share in consumer rupee was 5.76 percent and purchase price of consumer was 16204.26 ₹/q.

Table 9: Marketing cost, marketing margin and price spread of channel VIII

Particular	Cost (₹/q)	% to consumer price
Net price received by producer	933.62	5.76
Cost incurred by producer		
Grading and packing	10.00	0.06
Loss	8.90	0.05
Total cost	18.90	0.12
Sale price of producer/Purchase price of processor	952.52	5.88
Cost incurred by processor		
Packing material	16.00	0.10
Loading and unloading	6.00	0.04
Transportation	50.00	0.31
Weighing	8.90	0.05
Storage	250.00	1.54
Loss	4.36	0.03
Operational cost	3217.21	19.85
Labour	1819.60	11.23
Electricity	2786.92	17.20
Packaging material	144.39	0.89
Other cost	2218.16	13.69
Marketing cost	10521.24	64.93
Marketing margin	4730.53	29.19
Sale price of processor/Purchase price of exporter	16204.26	100.00
Net price received by producer	933.62	5.76
Total marketing cost	10540.14	65.05
Total marketing margin	4730.53	29.19
Price spread	15270.67	94.24

Marketing efficiency and price spread of different channels of potato

The marketing efficiency shows the performance of marketing channels. Marketing efficiency of potato has been differently presented with their end use product.

Table 10 shows the marketing efficiency for channel I and II in which the end product was french fries. The net price received by producer for marketing channel I and II was 1405.35 ₹/q. Price paid by consumer for marketing channel I and II was 20832.52 ₹/q and 14000 ₹/q, respectively. Marketing efficiency of channel I and II was estimated 0.07 and 0.11.

Table 10: Marketing efficiency and price spread of marketing channel I, II

Particular	Channel I	Channel II
Net price received by producer (₹/q)	1405.35	1405.35
Price paid by consumer (₹/q)	20832.52	14000.00
Total marketing cost (₹/q)	8314.00	8314.10
Total marketing margin (₹/q)	11113.17	4280.55
Price spread (₹/q)	19427.17	12594.65
Producer's share in consumer rupee (%)	6.75	10.03
Marketing efficiency	0.07	0.11

Table 11 shows the marketing efficiency for channel III and IV in which the end product was chips. The net price received by producer for marketing channel III and IV was 1282.97 ₹/q. Price paid by consumer for marketing channel III and IV was 3630.19 ₹/q and 3630.22 ₹/q, respectively. Marketing efficiency of channel III and IV was estimated 0.54.

Table 11: Marketing efficiency and price spread of marketing channel III, IV

Particular	Channel III	Channel IV
Net price received by producer (₹/q)	1282.97	1282.97
Price paid by consumer (₹/q)	3630.19	3630.22
Total marketing cost (₹/q)	2082.15	2105.15
Total marketing margin (₹/q)	265.07	258.68
Price spread (₹/q)	2347.22	2363.83
Producer's share in consumer rupee (%)	35.34	35.34
Marketing efficiency	0.54	0.54

Table 12 shows the marketing efficiency for channel V and VI in which the end product was flakes. The net price received by producer for marketing channel V and VI was 921.78 ₹/q. Price paid by consumer for marketing channel V and VI was 23921.02 ₹/q and 15944.68 ₹/q, respectively. Marketing efficiency of channel V and VI was estimated 0.04 and 0.07, respectively.

Table 12: Marketing efficiency and price spread of marketing channel V, VI

Particular	Channel V	Channel VI
Net price received by producer (₹/q)	921.78	921.78
Price paid by consumer (₹/q)	23921.02	15944.68
Total marketing cost (₹/q)	15061.76	8322.27
Total marketing margin (₹/q)	7933.48	4272.53
Price spread (₹/q)	22995.24	12594.80
Producer's share in consumer rupee (%)	3.85	5.78
Marketing efficiency	0.04	0.07

Table 13 shows the marketing efficiency for channel VII and VIII in which the end product was aloo tikki. The net price received by producer for marketing channel VII and VIII was 933.62 ₹/q. Price paid by consumer for marketing channel VII and VIII was 21351.88 and 16204.26 ₹/q, respectively. Marketing efficiency of channel VII and VIII was estimated 0.04 and 0.06, respectively.

Table 13: Marketing efficiency and price spread of marketing channel VII, VIII

Particular	Channel VII	Channel VIII
Net price received by producer (₹/q)	933.62	933.62
Price paid by consumer (₹/q)	21351.88	16204.26
Total marketing cost (₹/q)	10540.14	10540.14
Total marketing margin (₹/q)	9878.12	4730.53
Price spread (₹/q)	20418.26	15270.67
Producer's share in consumer rupee (%)	4.37	5.76
Marketing efficiency	0.04	0.06

Conclusion
The study explores the structure and efficiency of potato marketing channels in Gujarat, focusing on key processed products such as French fries, chips, flakes, and aloo tikki. Findings revealed considerable inefficiencies in the marketing system, characterized by high costs, multiple

intermediaries and limited producer benefits. Producers received a small share of the final consumer price, often under 10 percent in most channels. The cost of marketing, influenced by grading, transportation, storage and processing, significantly reduced profitability for farmers. For example, channels dealing with high-value processed products like flakes and aloo tikki incurred substantial marketing costs due to labour-intensive processing and inadequate infrastructure. The study emphasizes that low marketing efficiency and a wide price spread are major barriers to optimizing the potato value chain. Addressing these challenges requires investment in cold chain facilities, improved storage and transportation systems and reducing intermediary layers. Policies promoting direct market access for farmers and transparent pricing mechanisms could enhance their share in consumer prices and improve the overall efficiency and sustainability of potato marketing in Gujarat.

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