

RESEARCH PAPER

# Economic Analysis of Value Addition and Marketing of Acid Lime Products in North Karnataka, India

Yalguresh<sup>1</sup>, Suresh, K.<sup>1\*</sup>, Lokesh, G.B.<sup>1</sup>, Devendra Beeraladinni<sup>1</sup> and Shekharagouda Patil<sup>2</sup>

<sup>1</sup>Department of Agricultural Economics, UAS, Raichur, Karnataka, India

<sup>2</sup>Department of Horticulture, UAS, Raichur, Karnataka, India

\*Corresponding author: suresh.krishnanaik@gmail.com (ORCID ID: 0000-0002-7786-9287)

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## ABSTRACT

Value addition serves as an effective strategy to reduce post-harvest losses, extend shelf life, and improve the marketability of agricultural produce. The present study was conducted in North Karnataka to examine the production economics and marketing structure of value-added acid lime products. A total of 45 respondents were selected using the snowball sampling technique, comprising 15 value creators and 30 market intermediaries. Three major value-added products were identified: lime squash, lime powder, and lime pickle. Cost and return analysis revealed that lime powder processing generated the highest net returns (₹ 74,988), yielding ₹ 2.67 per rupee invested, followed by lime squash (₹ 2.30) and lime pickle (₹ 2.26). Two major marketing channels were observed; among them, Channel-II (Processor → Local retailer → Consumer) exhibited higher marketing efficiency and a greater processor share in the consumer rupee compared to Channel-I. The findings indicate that value addition substantially enhances profitability and improves marketing efficiency, highlighting strong potential for promoting small-scale processing enterprises to strengthen farmer incomes and rural livelihoods.

## HIGHLIGHTS

- Net returns were ₹ 74,988 for lime powder, ₹ 14,159 for lime pickle, ₹ 13,566 for lime squash, and ₹ 1,730 for raw lime.
- Returns per rupee of investment were ₹ 2.67 for lime powder, ₹ 2.30 for lime squash, ₹ 2.26 for raw lime, and ₹ 2.20 for lime pickle.
- Value addition substantially enhanced profitability compared to selling raw lime.
- Lime powder emerged as the most profitable value-added product.

**Keywords:** Acid lime, Cost and returns, Value addition, Value-added products, Market intermediaries, Marketing channels, Marketing efficiency

Horticulture is a rapidly growing and important sub-sector of Indian agriculture, contributing nearly 30.4 per cent to the agricultural Gross Domestic Product (GDP) while occupying only 13.1 per cent of the gross cropped area. It includes the scientific cultivation of fruits, vegetables, flowers, spices, medicinal plants and herbs, serving nutritional, medicinal and aesthetic purposes (Anonymous, 2023).

Fruits are among the oldest and most naturally nutritious foods available to humankind, valued

for both their taste and their health-promoting properties. They are rich sources of essential nutrients such as vitamins, minerals, dietary fibre, antioxidants and certain bioactive compounds that support overall health, strengthen immunity, aid digestion and help prevent various diseases. Fruit

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cultivation also enhances farmers' socioeconomic well-being and provides improved income opportunities, particularly for small and marginal growers. In India, major fruit crops include mango, banana, lime, apple, guava, pineapple, grapes and sapota.

Acid lime exhibits cyclical growth flushes throughout the year, namely Mrig Bahar (June–July bloom), Hasta Bahar (September–October bloom) and Ambe Bahar (January–February bloom). Hasta Bahar fruits typically fetch higher prices in the market; however, inducing this flush in southern India is challenging due to rainfall and the absence of adequate moisture stress during September. Acid lime trees begin bearing fruit from the fifth year, producing around 50–60 fruits per tree, and by the tenth year the yield stabilizes at about 1,000–1,500 fruits per tree. The economic lifespan of an acid lime orchard is approximately 25–30 years (Thejeswini, 2015).

Value addition involves enhancing the economic worth of a product by altering its form, function or utility to meet consumer preferences and improve profitability. Converting perishable produce into processed or semi-processed products—such as pickles, powders and concentrates—helps reduce post-harvest losses, generates employment opportunities, increases farmers' income and supports rural economic development (Raut, 2018). Therefore, the present study aimed to examine value addition in acid lime, identify the major value-added products and assess their marketing patterns in the study area.

## MATERIALS AND METHODS

The study was carried out in the Vijayapura and Kalaburagi districts of North Karnataka. Using the snowball sampling technique, 15 value creators were initially selected to identify the major value-added products of acid lime. Based on the information gathered from them, three prominent value-added products were identified, and for each product, five producers were selected for an in-depth analysis.

To examine the marketing structure of these value-added products, a total of 30 market intermediaries were selected, comprising 10 processors, 8 distributor-cum-wholesalers, 6 distant retailers and 6 local retailers. In total, 45 respondents participated in the detailed study, including 15 value creators

and 30 market intermediaries associated with acid lime value-added products.

### Cost and returns of value-added products

Various value-added products from acid lime were being produced by the processors in the study area. Cost and returns for each of the value-added product was worked out. Computation includes following aspects:

#### Gross returns

It is the total returns on expenditure incurred before deducting the expenses or the total costs.

$$\text{Gross returns} = \text{Price} \times \text{total output sold}$$

#### Net returns

It is the total returns on expenditure incurred after deducting the expenses or the total costs.

$$\text{Net returns} = \text{Gross returns} - \text{Total cost}$$

#### Returns per rupee of expenditure

$$\text{Returns per rupee of expenditure} = \frac{\text{Gross returns}}{\text{Total cost of production}}$$

### Acharya and Agrawal Method

An efficient marketing channel ensures fair prices for all its members and helps to maintain price balance throughout the entire channel (Acharya, 2014). Acharya's formula was used for calculating the marketing efficiency of different channels. The higher the ratio, higher the marketing efficiency and vice versa. It is expressed as:

$$MME = FP / (MC + MM)$$

Where,

MME = Modified measure of marketing efficiency

FP = Net price received by Producer

MC = Total Marketing Cost

MM = Total Marketing Margin

### Shepherd's Measure

Shepherd has suggested that the ratio of the total value of goods marketed to the marketing cost may be used as a measure of marketing efficiency.

$$ME = CP / (MC + MM)$$

Where,

ME = Marketing efficiency

CP = Consumer's purchase price

MC = Total marketing cost

MM = Total Marketing Margin

If  $ME > 1$  → Marketing channel is efficient. A higher value indicates that a larger proportion of the consumer's rupee reaches the producer.

### Amortization of establishment cost

The establishment cost of the acid lime orchard was amortized and allocated as equal annual instalments over its economic life to estimate the yearly cost of cultivation. In order to estimate the annual share of the establishment, the following formula is adopted:

$$\text{Annual amortization cost (A)} = \frac{P \times [(1 + r)^n] \times r}{[(1 + r)^n] - 1}$$

Where,

A = Annual amortization cost (₹)

P = Investment cost (₹)

r = Discount rate (8.5 %)

n = Economic life in years

## RESULTS AND DISCUSSION

### Pattern of investment on lime squash and lime powder processing units

The investment required for establishing lime squash and lime powder processing units includes expenditure on land and building, machinery and equipment, power installation, licence fees and other miscellaneous costs, as presented in Table 1. A total capital outlay of ₹ 9,15,449 was incurred for setting up these units. The units considered in the study had an annual processing capacity of 600 kg of lime powder and 3,200 litres of lime squash.

Among the investment components, land and building constituted the largest share at ₹ 5,62,684, followed by machinery and equipment costing ₹ 2,34,565. The expenditure on power installation amounted to ₹ 65,200, while miscellaneous expenses totalled ₹ 45,000. The lowest investment was observed for licence fees at ₹ 8,000.

The results clearly indicated that land, building and machinery formed the major portion of the total capital investment in the processing units.

Processing lime into squash and powder requires specialised equipment for extraction, mixing and packaging, which in turn demands adequate space for installation, operation and storage of finished products. Consequently, higher investments were allocated to land, building and machinery. Similar observations were reported by Israel *et al.* (2019) in their assessment of tamarind processing units.

**Table 1:** Pattern of investment on lime squash and lime powder processing units (₹/unit)

Sl. No.	Particulars	Amount (₹)	Percentage (%)
1	Land and building	5,62,684	61.47
2	Machinery and equipment	2,34,565	25.62
3	Power installation	65,200	7.12
4	Licence fee	8,000	0.87
5	Other expenses	45,000	4.92
	Total	9,15,449	100.00

**Note:** Economic life of processing units is 20 years.

### Cost and returns in production of lime squash

The cost and returns associated with lime squash production are presented in Table 2. On average, 100 litres of lime squash were produced per unit at a total cost of ₹ 10,434. The major ingredient costs included sugar (₹ 2,000), acid lime for juice extraction (₹ 1,600), PET/Glass bottles (₹ 1,400), caps and labels (₹ 400), miscellaneous materials (₹ 400), water (₹ 120) and preservatives (₹ 32). Labour charges amounting to ₹ 800 were incurred mainly for processing and preparation activities.

The non-ingredient cost components consisted of the amortized establishment cost (₹ 3,000) and interest on working capital (₹ 683), which together contributed significantly to the total cost of production. The gross returns from 100 litres of lime squash amounted to ₹ 24,000, while the net returns were ₹ 13,566. This resulted in a return of ₹ 2.30 per rupee invested, demonstrating that lime squash production is a profitable and economically sustainable value-addition enterprise. These findings are consistent with the results reported by Torane *et al.* (2023) for mango processing in Maharashtra, where the net return was ₹ 3,686 with an input-output ratio of 1:1.30.

### Cost and returns in production of lime powder

The cost and returns for the production of lime powder was presented in Table 3. On average, 100 kg of lime powder were produced per unit, with a total production cost of ₹ 45,012. Among the ingredient and material costs, acid lime for juice extraction accounted for ₹ 12,562, followed by packing material (₹ 4,000), sugar (₹ 2,250), labelling material (₹ 1,000), miscellaneous expenses (₹ 1,000), cumin powder (₹ 880), black pepper (₹ 426), anti-caking agent (₹ 320), preservatives (₹ 189) and salt (₹ 40). The labour cost amounted to ₹ 1,600, which was required mainly for processing activities. The other than material costs consisted of the amortized establishment cost (₹ 17,800) and interest on working capital (₹ 2,945), which together formed a significant share of the total expenditure. The gross returns realized from 100 kg of lime juice powder production were ₹ 1,20,000, while the net returns worked out to ₹ 74,988. This given a return of ₹ 2.67 for every rupee invested.

**Table 2:** Cost and returns in production of lime squash

Sl. No.	Particulars	100 litre lime squash		%
		Quantity	Total cost (₹)	
<b>(a) Costs</b>				
1	Acid lime (kg)	80	1600	15.33
2	Sugar (kg)	50	2,000	19.18
3	Preservative (kg)	0.05	32	0.30
4	Water (lit)	60	120	1.15
5	PET/Glass bottles (No.)	200	1,400	13.42
6	Caps + Labels (No.)	200	400	3.83
7	Labour (No.)	2	800	7.67
8	Miscellaneous		400	3.83
9	Interest on working capital @ 7 per cent		683	6.54
10	Amortised establishment cost		3,000	28.75
	Total Cost of Production (₹)		10,434	100.00
<b>(b) Returns</b>				
11	Gross Returns (₹ 240/Ltr)	100	24,000	
12	Net Returns (₹)		13,566	
13	Returns per rupee of expenditure (₹)		2.30	

**Table 3:** Cost and returns in production of lime powder

Sl. No.	Particulars	100 kg lime powder		%
		Quantity	Total cost (₹)	
<b>(a) Costs</b>				
1	Acid lime (kg)	571	12,562	27.91
2	Sugar (kg)	50	2,250	5.00
3	Salt (kg)	2	40	0.09
4	Black pepper (kg)	0.30	426	0.95
5	Cumin powder (kg)	1	880	1.96
6	Preservative (KMS) (kg)	0.30	189	0.42
7	Anti-caking agent (kg)	1	320	0.71
8	Packing material (No.)	1,000	4,000	8.89
9	Labelling material (No.)	1,000	1,000	2.22
10	Labour (No.)	4	1,600	3.55
11	Miscellaneous		1,000	2.22
12	Interest on working capital @ 7 per cent		2,945	6.54
13	Amortised establishment cost		17,800	39.54
	Total Cost of Production (₹)		45,012	100.00
<b>(b) Returns</b>				
14	Gross Returns (₹ 1200/kg)	100	1,20,000	
15	Net Returns (₹)		74,988	
16	Returns per rupee of expenditure (₹)		2.67	

### Cost and returns in production of lime pickle

The cost and returns of lime pickle production was presented in Table 4. On average, 100 kg of lime pickle were produced per unit, with a total production cost of ₹ 11,841. Among the ingredient costs, mustard oil accounted for the highest expenditure of ₹ 4,000, followed by limes (₹ 1,760), methi (₹ 864), garlic (₹ 624), chilli powder (₹ 616), vinegar (₹ 560), turmeric powder (₹ 224) and mustard seeds (₹ 208). The amortised establishment cost was 1137, interest on working capital amounted to ₹ 688, packing material costed ₹ 600 and labour charges were ₹ 400. Labelling and miscellaneous expenses were relatively lower at ₹ 100 and ₹ 40, respectively.

The gross returns realized from 100 kg of lime pickle production were ₹ 26,000, while the net returns worked out to ₹ 14,159. This provided a return of ₹ 2.20 for every rupee invested and indicated

that lime pickle processing was a profitable value-added enterprise. Similar findings were reported by Kundan (2013) on aonla processing in Uttar Pradesh, India.

The economics of raw acid lime and its value-added products are presented in Table 5. For comparison, 100 kg of raw lime, 100 litres of lime squash, 100 kg of lime powder and 100 kg of lime pickle were considered. The cost of production was lowest for raw lime (₹ 1,370) and highest for lime powder (₹ 45,012), followed by lime pickle (₹ 11,841) and lime squash (₹ 10,434). The corresponding gross returns were ₹ 3,100 for raw lime, ₹ 24,000 for lime squash, ₹ 1,20,000 for lime powder and ₹ 26,000 for lime pickle, resulting in net returns of ₹ 1,730, ₹ 13,566, ₹ 74,988 and ₹ 14,159, respectively.

The returns per rupee of expenditure were ₹ 2.26 for raw lime, ₹ 2.30 for lime squash, ₹ 2.67 for lime powder and ₹ 2.20 for lime pickle. These results clearly indicated that value addition significantly enhanced the profitability of acid lime. Among the value-added products, lime powder yielded the highest profit, followed by lime squash and lime pickle, whereas the sale of raw lime generated the lowest returns due to the absence of processing and limited value addition.

These findings are consistent with the results of Deepa and Murthy (2019), who conducted an economic analysis of women's empowerment through jackfruit value addition in Bengaluru Rural District. Their study reported that processed jackfruit products such as jam, papad, chips and halwa generated higher returns per rupee of expenditure (ranging from 1.05 to 2.54) compared to raw jackfruit, demonstrating that value addition substantially improves profitability across products.

**Table 4:** Cost and returns in production of lime pickle

Sl. No.	Particulars	100 kg lime pickle		
		Quantity	Total cost (₹)	%
<b>(a) Costs</b>				
1	Acid lime (kg)	88	1,760	14.86
2	Salt (kg)	6	120	1.01
3	Garlic (kg)	2.40	624	5.27
4	Chilli powder (kg)	2.80	616	5.20
5	Turmeric powder (kg)	1.20	224	1.89

6	Mustard seeds (kg)	0.80	208	1.76
7	Methi (fenugreek) (kg)	2	864	7.30
8	Mustard oil (lit)	20	4,000	33.78
9	Vinegar (kg)	2	560	4.73
10	Packing material (No.)	100	500	4.22
11	Labelling material (No.)	100	100	0.84
12	Labour (No.)	1.6	400	3.38
13	Miscellaneous		40	0.34
14	Interest on working capital @ 7 per cent		688	5.81
15	Amortised establishment cost		1137	9.60
Total Cost of Production (₹)			11,841	100.00
<b>(b) Returns</b>				
1	Gross returns (₹ 260/kg)	100	26,000	
2	Net returns (₹)		14,159	
3	Returns per rupee of expenditure (₹)		2.20	

**Table 5:** Estimation of raw acid lime and product wise value addition to acid lime

Sl. No.	Products	Quantity	Cost of production (₹)	Price per unit	Gross returns (₹)	Net returns (₹)	Returns per rupee of expenditure (₹)
1	Raw lime (kg)	100	1,370	31	3,100	1,730	2.26
2	Lime squash (lit)	100	10,434	240	24,000	13,566	2.30
3	Lime powder (kg)	100	45,012	1200	1,20,000	74,988	2.67
4	Lime pickle (kg)	100	11,841	260	26,000	14,159	2.20

### Marketing channels of value-added products of acid lime

For value-added products such as lime pickle, lime squash and lime powder, processors played a central role in marketing. The main channels identified for these products were:

√ Channel-I: Processor → Distributor-cum-wholesaler → Distant retailer → Consumer → Channel-II: Processor → Local retailer → Consumer

In Channel-I, processors sold the products to distributors or wholesalers, who then supplied them to retailers before reaching consumers. In Channel-II, processors directly supplied the products to retailers, who subsequently sold them to consumers, reducing intermediaries and ensuring better price realization. These channels illustrate the flow of value-added products from production through processing to final consumption, highlighting the role of processors in linking farmers to the market.

### Marketing costs incurred by marketing intermediaries of value-added products

The marketing costs incurred by various marketing intermediaries of acid lime value-added products were presented in Table 6. For processors, the costs were ₹ 12.20 per kg for lime pickle, ₹ 13.00 per litre for lime squash and ₹ 14.08 per kg for lime powder, covering expenses related to handling, processing and packaging. Distributor cum-wholesalers incurred costs of ₹ 15.80 per kg for lime pickle, ₹ 16.20 per litre for lime squash and ₹ 17.16 per kg for lime powder, reflecting expenditures on transportation, storage and other operational activities. Distant retailers costs were ₹ 14.00 per kg for lime pickle, ₹ 14.76 per litre for lime squash and ₹ 15.20 per kg for lime powder, while local retailers recorded costs of ₹ 10.32 per kg for lime pickle, ₹ 11.00 per litre for lime squash and ₹ 12.32 per kg for lime powder. These figures showed the distribution of marketing costs across different market intermediaries and value-added products.

**Table 6:** Marketing cost incurred by marketing intermediaries of value-added products of acid lime

Sl. No.	Particulars	Processor (n=10)	Distributor-cum-wholesaler (n=8)	Distant retailer (n=6)	Local retailer (n=6)
1	Lime pickle (₹ / kg)	12.20	15.80	14.00	10.32
2	Lime squash (₹ / lit)	13.00	16.20	14.76	11.00
3	Lime powder (₹ / kg)	14.08	17.16	15.20	12.32

### Price spread in marketing of lime squash

The price spread and marketing margins of lime squash through Channel-I and Channel-II were presented in Table 7. In Channel-I, processors incurred a processing cost of ₹ 104.34 per litre and a marketing cost of ₹ 13.00 per litre, earning a margin of ₹ 122.66 per litre, which resulted in a sale price of ₹ 240 per litre.

**Table 7:** Price spread in marketing of lime squash

Sl. No.	Particulars	Channel-I (₹/ litre)	Channel-II (₹/ litre )
<b>(I) Processor</b>			
	Processing cost	104.34	104.34
	Marketing cost	13.00	13.00
	Margin	122.66	122.66
	Sale price	240	240
<b>(II) Distributor-cum-Wholesaler</b>			
	Purchase price	240	-
	Marketing cost	16.20	-
	Margin	23.80	-
	Sale price	280	-
<b>(III) Distant Retailer</b>			
	Purchase price	280	-
	Marketing cost	14.76	-
	Margin	25.24	-
	Sale price	320	-
<b>(IV) Local Retailer</b>			
	Purchase price	-	240
	Marketing cost	-	11.00
	Margin	-	29.00
	Sale price	-	280
<b>(V)</b>	Total marketing costs	43.96	24
<b>(VI)</b>	Total marketing margins	171.70	151.66
<b>VII</b>	Consumer price	320	280
	Price Spread	80	40
	Processor's share in consumer rupee (%)	75.00	85.71

Distributor-cum wholesalers purchased lime squash at ₹ 240 per litre, spent ₹ 16.20 per litre on marketing and earned a margin of ₹ 23.80 per litre, thereby selling it at ₹ 280 per litre. Distant retailers purchased at ₹ 280 per litre, incurred a marketing cost of ₹ 14.76 per litre and earned a margin of ₹ 25.24 per litre, resulting in a final consumer price of ₹ 320 per litre. In Channel-II,

processors had the same processing cost, marketing cost and margin as in Channel-I. Local retailers purchased at ₹ 240 per litre, incurred a marketing cost of ₹ 11.00 per litre and earned a margin of ₹ 29.00 per litre, sold the product at ₹ 280 per litre.

The total price spread was higher in Channel-I (₹ 80 per litre) compared to Channel-II (₹ 40 per litre), indicating that the presence of more intermediaries and higher marketing expenses in Channel-I increased the price spread, whereas Channel-II, with fewer intermediaries and lower marketing costs, had a smaller price spread. Consequently, the processor's share in the consumer rupee was higher in Channel-II (85.71 %) than in Channel-I (75.00 %), showing that Channel-II was more efficient and profitable. This indicated that Channel-II had been more beneficiary for processors, as a larger proportion of the consumer price reached them due to fewer intermediaries and lower marketing expenses, thereby improving overall marketing efficiency and profitability.

### Price spread in marketing of lime powder

The price spread of lime powder through Channel-I and Channel-II were presented in Table 8. In Channel-I, processors spent ₹ 450.12 on processing and ₹ 14.08 on marketing, earning a margin of ₹ 735.80, which resulted in a sale price of ₹ 1,200. Distributor-cum-wholesalers purchased the product at ₹ 1,200, incurred a marketing cost of ₹ 17.16 and earned a margin of ₹ 42.84, selling it at ₹ 1,260. Distant retailers purchased at ₹ 1,260, spent ₹ 15.20 on marketing and earned a margin of ₹ 24.80, leading to a final consumer price of ₹ 1,300. In Channel-II, processors had the same processing cost, marketing cost and margin as in Channel-I. Local retailers purchased at ₹ 1,200, incurred a marketing cost of ₹ 12.32 and earned a margin of ₹ 37.68, sold the product at ₹ 1,250.

The total price spread was higher in Channel-I (₹ 100) compared to Channel-II (₹ 50), indicating that the presence of more intermediaries and higher marketing expenses in Channel-I had reduced the processor's share in the consumer rupee. Consequently, the processor's share in the consumer rupee was higher in Channel-II (96 %) than in Channel-I (92.31 %), showing that Channel-II was more efficient and profitable. This indicated that Channel-II had been more advantageous for

processors, as a larger proportion of the consumer price reached them due to fewer intermediaries and lower marketing expenses, thereby improving overall marketing efficiency and profitability. These outcomes are similar with the study of Chand *et al.* (2021) on marketing efficiency of kinnow and aonla in Rajasthan.

**Table 8:** Price spread in marketing of lime powder

Sl. No.	Particulars	Channel-I (₹/kg)	Channel-II (₹/kg)
<b>(I) Processor</b>			
	Processing cost	450.12	450.12
	Marketing cost	14.08	14.08
	Margin	735.80	735.80
	Sale price	1,200	1,200
<b>(II) Distributor-cum-Wholesaler</b>			
	Purchase price	1,200	–
	Marketing cost	17.16	–
	Margin	42.84	–
	Sale price	1,260	–
<b>(III) Distant Retailer</b>			
	Purchase price	1,260	–
	Marketing cost	15.20	–
	Margin	24.80	–
	Sale price	1,300	–
<b>(IV) Local Retailer</b>			
	Purchase price	–	1,200
	Marketing cost	–	12.32
	Margin	–	37.68
	Sale price	–	1,250
<b>(V)</b>	Total marketing costs	46.44	26.40
<b>(VI)</b>	Total marketing margins	803.44	773.48
<b>(VII)</b>	Consumer price	1,300	1,250
	Price Spread	100	50
	Processor's share in consumer rupee (%)	92.31	96.00

### Price spread in marketing of lime pickle

The price spread and marketing margins of lime pickle were analyzed through Channel-I and Channel-II was presented in Table 9. In Channel-I, processors incurred a processing cost of ₹ 115.20 per kg and marketing cost of ₹ 12.20 per kg, earning a margin of ₹ 132.60 per kg, which resulted in a sale price of ₹ 260 per kg. Distributor cum-wholesalers purchased at ₹ 260 per kg, spent ₹ 15.80 per kg on

marketing and earned a margin of ₹ 24.20 per kg, selling at ₹ 300 per kg. Distant retailers purchased at ₹ 300 per kg, incurred marketing cost of ₹ 14 per kg and earned a margin of ₹ 36 per kg, with the final consumer price at ₹ 350 per kg. In Channel-II, processors had the same costs and margins as in Channel-I. Local retailers purchased at ₹ 260 per kg, incurred marketing cost of ₹ 10.32 per kg and earned a margin of ₹ 29.68 per kg, sold the product at ₹ 300 per kg.

**Table 9:** Price spread in marketing of lime pickle

Sl. No.	Particulars	Channel-I (₹/kg)	Channel-II (₹/kg)
<b>(I) Processor</b>			
	Processing cost	115.20	115.20
	Marketing cost	12.20	12.20
	Margin	132.60	132.60
	Sale price	260	260
<b>(II) Distributor-cum-Wholesaler</b>			
	Purchase price	260	-
	Marketing cost	15.80	-
	Margin	24.20	-
	Sale price	300	-
<b>(III) Distant Retailer</b>			
	Purchase price	300	-
	Marketing cost	14	-
	Margin	36	-
	Sale price	350	-
<b>(IV) Local Retailer</b>			
	Purchase price	-	260
	Marketing cost	-	10.32
	Margin	-	29.68
	Sale price	-	300
<b>(V)</b>	Total marketing costs	42	22.52
<b>VI</b>	Total marketing margins	192.80	162.28
<b>(VII) Consumer price</b>			
	Price Spread	90	40
	Processor's share in consumer rupee (%)	74.29	86.67

The total price spread was higher in Channel-I (₹ 90 per kg) compared to Channel-II (₹ 40 per kg), indicating that the presence of more intermediaries and higher marketing expenses in Channel-I had reduced the share of processor's share in consumer rupee. In contrast, Channel-II involved fewer intermediaries, which resulted in lower marketing

costs and a smaller price spread. Consequently, the processor's share in the consumer rupee was higher in Channel-II (86.67 %) than in Channel-I (74.29 %), showing that Channel-II was more efficient and profitable. This showed that Channel-II was more advantageous for processors as a higher proportion of the consumer price reached them due to lower market intermediary costs and thereby improving overall marketing efficiency and profitability.

The marketing efficiency of different value-added products of acid lime, measured using Acharya and Shepherd methods was presented in Table 10. For lime pickle, Channel-I showed a marketing efficiency of 1.11 using Acharya method and 1.49 using the Shepherd method, while Channel-II showed higher efficiency values of 1.41 and 1.62, respectively. In case of lime squash, Channel-I had an efficiency of 1.05 (Acharya method) and 1.48 (Shepherd method), whereas Channel-II had an efficiency of 1.29 (Acharya method) and 1.59 (Shepherd method). For lime powder, Channel-I showed the values of 1.39 (Acharya method) and 1.53.

**Table 10:** Marketing efficiency under different marketing channels of value-added products

Sl. No.	Marketing Channel	Marketing efficiency	
		Acharya method	Shepherd method
<b>(I) Lime pickle</b>			
1	Channel-I	1.11	1.49
2	Channel-II	1.41	1.62
<b>(II) Lime squash</b>			
1	Channel-I	1.05	1.48
2	Channel-II	1.29	1.59
<b>(III) Lime powder</b>			
1	Channel-I	1.39	1.53
2	Channel-II	1.48	1.56

*Note:* Channel-I: Processor → Distributor-cum-wholesaler → Retailer → Consumer Channel-II: Processor → Retailer → Consumer.

(Shepherd method), while Channel-II had showed 1.48 (Acharya method) and 1.56 (Shepherd method). These results indicated that Channel-II consistently showed higher marketing efficiency across all products, suggesting that this channel is more effective in moving the product from processors to consumers. The higher efficiency can be attributed to relatively lower marketing costs and the involvement of fewer intermediaries, which gives a greater

share of the consumer price to reach the processor. Conversely, Channel-I showed comparatively lower efficiency, reflecting higher costs and margins in marketing chain, which reduced the returns received by the processor. These observations are similar to the study of Suradkar (2020) on marketing of custard apple in Maharashtra.

## CONCLUSION

Value addition in acid lime significantly enhanced profitability when compared to the sale of raw fruits. Among the value-added products, lime powder recorded the highest net returns and the maximum returns per rupee of expenditure, followed by lime squash and lime pickle, indicating that processing increased the shelf life and market value of the produce. The marketing analysis showed that two channels were followed for the distribution of value-added products and Channel-II (Processor → Local Retailer → Consumer) was found to be more efficient than Channel-I due to lower marketing costs and fewer intermediaries. Marketing efficiency values calculated using Acharya and Shepherd methods also confirmed the superior performance of Channel-II. Overall, value addition and the adoption of shorter, efficient marketing channels had improved the income and profitability of acid lime processors in North Karnataka.

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