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### Identifying and analyzing sugarcane marketing channels in Gujarat

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#### Abstract

Growth of sugarcane production in Gujarat is eye catching in last few years. Besides that, due to perishable nature of sugarcane, marketing factor plays an important role. The current study focuses on identification of marketing channels. The present study was conducted in Gujarat. From 200 farmers data were collected through predesigned schedule. Acharya's modified method was used for calculation of marketing efficiency. In the study area, 6 marketing channels of sugarcane were identified viz., (I) Farmer - sugar factory (II) Farmer - jaggery processing unit (III) Farmer - sugarcane juice centre (IV) Farmer - wholesaler - sugarcane juice centre (V) Farmer - wholesaler - retailer - consumer (VI) Farmer - wholesaler - retailer - consumer. Marketing efficiency was the highest of channel III.

**Keywords:** Marketing, sugarcane, marketing efficiency, acharya's modified method

#### Introduction

Agriculture constitutes a fundamental pillar of the Indian economy. Agriculture remains a crucial source of employment for roughly 58% of the Indian population. (Balas & Prajapati, 2023) <sup>[2]</sup> Sugarcane occupies a prominent position in Indian agriculture, generating higher revenue compared to many other crops. (Indian Sugar Mill Association, 2021) <sup>[5]</sup> India ranked second worldwide in sugarcane production during the 2020-21 period. Sugarcane cultivation covered an area of 4.851 Mha, resulting in a total production of 405.399 Mt. (Commodities, 2022) <sup>[3]</sup> In 2020-21 Gujarat demonstrated substantial growth in sugarcane production. While ranking fifth nationally in terms of sugarcane cultivation area, the state secured the fourth position in overall sugarcane production. With 2,19,300 ha under cultivation, the state produced a substantial 16.954 Mt of sugarcane. (Directorate of Agriculture, 2022) <sup>[4]</sup>

Sugarcane is perishable crop. Within 24 hours, sugarcane should be crushed, otherwise there would be loss of moisture in sugarcane and low sucrose in juice. Hence, after harvesting it is important to sell the produce as soon as possible. Consequently, the marketing of sugarcane assumes a crucial role.

#### Methodology

This study, conducted in Gujarat, utilized both primary and secondary data sources. Primary data was collected between 2021 and 2022 through a pre-designed schedule administered to farmers. Secondary data was sourced from research papers, government reports, and online resources. A multi-stage sampling method was employed for the study. In the first stage, the top 10 districts with the highest

sugarcane cultivation area in 2019-20 (Surat, Bharuch, Tapi, Navsari, Narmada, Valsad, Dang, Gir Somnath, Junagadh, and Vadodara) were purposefully selected. In the second stage, two talukas were randomly chosen from each of these districts. In the third stage, two villages were randomly selected from each taluka, resulting in a total of 40 villages included in the study. Finally, in the fourth stage, five farmers were randomly selected from each village, leading to a total sample size of 200 farmers. Further, data was collected from market functionaries like 5 sugar factories, 5 jaggery processing units, 10 sugarcane juice centres, 5 wholesalers and 5 retailers randomly from all over Gujarat.

#### Marketing Efficiency

Marketing efficiency was estimated through Acharya's modified method. Marketing efficiency was calculated through following formula:

$$\text{Marketing efficiency} = \left( \frac{\text{Price paid by consumer}}{\text{Total marketing costs} + \text{Total marketing margins}} \right) - 1$$

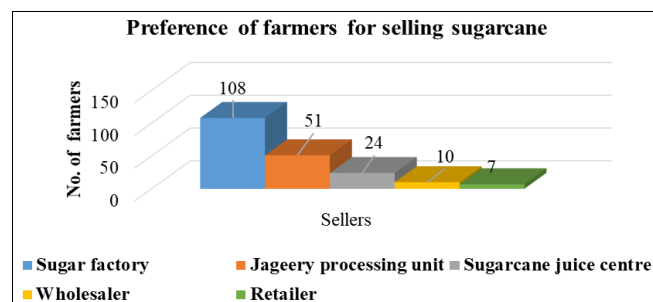
Source: Acharya & Agarwal, 2021 <sup>[1]</sup>

#### Results and Discussion

##### Preference of Farmers for Sugarcane Selling

Fig. 1 shows farmers' preference for selling produce in the market. In the study area farmers had 5 options for sugarcane selling viz., sugar factory, jaggery processor, sugarcane juice centre, wholesaler and retailer. Sugar factory was the most preferred choice for selling sugarcane, as 108 farmers sold their produce to the sugar factory. In Gujarat, all the sugar factories were cooperative sugar

factories. Jaggery processing unit was the second most preferred option as 51 farmers chose to sell their sugarcane to them. Sugarcane juice centre was the choice of 24 farmers for selling their sugarcane, whereas 10 and 7 farmers sold their sugarcane to the wholesaler and retailer respectively.



Source: Field survey

Fig 1: Preference of farmers for selling sugarcane

### Marketing channels

In the study area, 6 marketing channels of sugarcane were identified which were as following. Majority of farmers sold their produce through channel I because sugar factory paid more than jaggery processing unit for the produce and there was no surety for purchasing the sugarcane from sugarcane juice centre, wholesaler or retailer.

**Channel I:** Farmer - sugar factory

**Channel II:** Farmer - jaggery processing unit

**Channel III:** Farmer - sugarcane juice centre

**Channel IV:** Farmer - wholesaler - sugarcane juice centre

**Channel V:** Farmer - wholesaler - retailer - consumer

**Channel VI:** Farmer - wholesaler - retailer – consumer

### Marketing Cost, Marketing Margin and Price Spread of Channel I for Sugarcane

Table 1 indicates marketing costs and price spread of sugarcane for channel I in the study area. In channel I, farmers sold sugarcane to sugar factory. Total marketing cost was 32.59 ₹/q. In marketing cost of producer, costs of loading (4.50 ₹/q), transportation (6.50 ₹/q) and post-harvest losses (6.25 ₹/q) were included. In marketing cost of sugar factory, costs of weighing (4.00 ₹/q), unloading (4.50 ₹/q), storage (2.15 ₹/q) and losses (4.69 ₹/q) were included. Here sugar factory was the consumer of channel. Further sugar factory processed sugarcane for producing sugar. Price spread of the channel was 32.59 ₹/q. Net price received by producer was 295.25 ₹/q. 94.48 per cent was producer's share in consumer's rupee. Consumer's purchase price was 312.50 ₹/q. This channel was preferred in Surat, Bharuch, Tapi, Navsari, Narmada, Valsad, Dang and Vadodara districts by most of the farmers. Although farmers who were not shareholders of sugar factories could not sell sugarcane in sugar factories. This channel was not preferred in Junagadh and Gir Somnath districts due to non-functioning condition of sugar factory. Similarly, Mishra (2016)<sup>[6]</sup> found channel I in the study and net price received by producer was 258.00 ₹/q and purchase price of consumer was 280.00 ₹/q.

Table 1: Marketing cost, marketing margin and price spread of channel I for sugarcane

| Particular                            | Cost (₹/q) | % to consumer's price |
|---------------------------------------|------------|-----------------------|
| <b>Cost incurred by producer</b>      |            |                       |
| Net price received by producer        | 295.25     | 94.48                 |
| Loading                               | 4.50       | 1.44                  |
| Transportation                        | 6.50       | 2.08                  |
| Post-harvest losses                   | 6.25       | 2.00                  |
| Marketing cost                        | 17.25      | 5.52                  |
| <b>Cost incurred by sugar factory</b> |            |                       |
| Purchase price of sugar factory       | 312.50     | 100.00                |
| Unloading                             | 4.50       | 1.44                  |
| Weighing                              | 4.00       | 1.28                  |
| Storage                               | 2.15       | 0.69                  |
| Losses                                | 4.69       | 1.50                  |
| Marketing cost                        | 15.34      | 4.91                  |
| Total marketing cost                  | 32.59      | 10.43                 |
| Total marketing margin                | 0          | 0                     |
| Price spread                          | 32.59      | 10.43                 |

Source: Field survey

### Marketing Cost, Marketing Margin and Price Spread of Channel II for Sugarcane

In channel II, farmers sold sugarcane to jaggery processing unit. From Table 2 it can be inferred that total marketing cost was 34.23 ₹/q. In marketing cost of producer, costs of loading (4.00 ₹/q), transportation (7.25 ₹/q) and post-harvest losses (5.70 ₹/q) were included. In marketing cost of jaggery processing unit, costs of weighing (4.50 ₹/q), unloading (5.50 ₹/q), storage (3.00 ₹/q) and losses (4.28 ₹/q) were included. Like channel I in channel II also jaggery processing unit was consumer. Further, sugarcane was crushed for producing of jaggery. Price spread was 34.23 ₹/q in Channel II. 268.05 ₹/q was net price received by producer and 94.05 per cent was producer's share in consumer's rupee. Consumer's purchase price was 285.00 ₹/q.

Table 2: Marketing cost, marketing margin and price spread of channel II for sugarcane

| Particular                                      | Cost (₹/q) | % to consumer's price |
|-------------------------------------------------|------------|-----------------------|
| <b>Cost incurred by producer</b>                |            |                       |
| Net price received by producer                  | 268.05     | 94.05                 |
| Loading                                         | 4.00       | 1.40                  |
| Transportation                                  | 7.25       | 2.54                  |
| Post-harvest losses                             | 5.70       | 2.00                  |
| Marketing cost                                  | 16.95      | 5.95                  |
| <b>Cost incurred by jaggery processing unit</b> |            |                       |
| Purchase price of jaggery processing unit       | 285.00     | 100.00                |
| Unloading                                       | 5.50       | 1.93                  |
| Weighing                                        | 4.50       | 1.58                  |
| Storage                                         | 3.00       | 1.05                  |
| Losses                                          | 4.28       | 1.50                  |
| Marketing cost                                  | 17.28      | 6.06                  |
| Total marketing cost                            | 34.23      | 12.01                 |
| Total marketing margin                          | 0          | 0                     |
| Price spread                                    | 34.23      | 12.01                 |

Source: Field survey

### Marketing Cost, Marketing Margin and Price Spread of Channel III for Sugarcane

In Channel III, farmer sold sugarcane to sugarcane juice centre. Table 3 shows marketing costs and price spread in channel III. 22.25 ₹/q and 42.63 ₹/q were marketing costs of producer and sugarcane juice centre in channel III. Total marketing cost was 64.88 ₹/q. Costs of weighing (3.50 ₹/q) and post-harvest losses (18.75 ₹/q) were included in producer's marketing cost. Costs of loading and unloading (10.00 ₹/q), transportation (8.00 ₹/q), storage (4.00 ₹/q) and losses (20.63 ₹/q) were included in marketing cost of

sugarcane juice centre. Sugarcane juice centre was consumer of channel III. Further, buyer sold sugarcane juice. Price spread was 64.88 ₹/q. Net price received by producer was 727.75 ₹/q and producer's share in consumer's rupee was 97.03 per cent. Consumer's purchase price in channel III was 750.00 ₹/q. In areas where farms were closer to the sugarcane juice centre, this channel was favoured. Mishra (2016) [6] found channel III in the study and net price of received by producer was 191.00 ₹/q and consumer's purchase price was 220.00 ₹/q.

**Table 3:** Marketing cost, marketing margin and price spread of channel III for sugarcane

| Particular                                     | Cost (₹/q) | % to consumer's price |
|------------------------------------------------|------------|-----------------------|
| <b>Cost incurred by producer</b>               |            |                       |
| Net price received by producer                 | 727.75     | 97.03                 |
| Weighing                                       | 3.50       | 0.47                  |
| Post-harvest losses                            | 18.75      | 2.50                  |
| Marketing cost                                 | 22.25      | 2.97                  |
| <b>Cost incurred by sugarcane juice centre</b> |            |                       |
| Purchase price of sugarcane juice centre       | 750.00     | 100.00                |
| Loading and unloading                          | 10.00      | 1.33                  |
| Transportation                                 | 8.00       | 1.07                  |
| Storage                                        | 4.00       | 0.53                  |
| Losses                                         | 20.63      | 2.75                  |
| Marketing cost                                 | 42.63      | 5.68                  |
| Total marketing cost                           | 64.88      | 8.65                  |
| Total marketing margin                         | 0          | 0                     |
| Price spread                                   | 64.88      | 8.65                  |

Source: Field survey

### Marketing Cost, Marketing Margin and Price Spread of Channel IV for Sugarcane

Table 4 inferred marketing cost, marketing margin and price spread of sugarcane marketing channel IV. Marketing costs for producer, wholesaler and sugarcane juice centre were 22.50 ₹/q, 41.50 ₹/q and 50.00 ₹/q respectively. Total marketing cost was 114.00 ₹/q. In producer's marketing cost, costs of weighing (3.50 ₹/q) and post-harvest losses (19.00 ₹/q) were included. Wholesaler's marketing costs included costs of loading and unloading (10.00 ₹/q),

transportation (8.00 ₹/q), storage (2.50 ₹/q) and losses (21.00 ₹/q). In sugarcane juice centre's marketing cost, costs of transportation (16.00 ₹/q), loading and unloading (10.00 ₹/q), storage (3.00 ₹/q) and losses (21.00 ₹/q) were included. Channel IV was shown in those areas from where sugarcane farms were far. Price spread in channel IV was 114.00 ₹/q. Net price received by producer was 737.50 ₹/q and producer's per cent to consumer rupee was 52.68 per cent. Purchase price of consumer was 1,400.00 ₹/q.

**Table 4:** Marketing cost, marketing margin and price spread of channel IV for sugarcane

| Particular                                     | Cost (₹/q) | % to consumer's price |
|------------------------------------------------|------------|-----------------------|
| <b>Cost incurred by producer</b>               |            |                       |
| Net price received by producer                 | 737.50     | 52.68                 |
| Weighing                                       | 3.50       | 0.25                  |
| Post-harvest losses                            | 19.00      | 1.36                  |
| Marketing cost                                 | 22.50      | 1.61                  |
| <b>Cost incurred by wholesaler</b>             |            |                       |
| Purchase price of wholesaler                   | 760.00     | 54.29                 |
| Loading and unloading                          | 10.00      | 0.71                  |
| Transportation                                 | 8.00       | 0.57                  |
| Storage                                        | 2.50       | 0.18                  |
| Losses                                         | 21.00      | 1.50                  |
| Marketing cost                                 | 41.50      | 2.96                  |
| Marketing margin                               | 598.50     | 42.75                 |
| <b>Cost incurred by sugarcane juice centre</b> |            |                       |
| Purchase price of sugarcane juice centre       | 1,400.00   | 100.00                |
| Loading and unloading                          | 10.00      | 0.71                  |
| Transportation                                 | 16.00      | 1.14                  |
| Storage                                        | 3.00       | 0.21                  |
| Losses                                         | 21.00      | 1.50                  |
| Marketing cost                                 | 50.00      | 3.57                  |
| Total marketing cost                           | 114.00     | 8.14                  |
| Total marketing margin                         | 598.50     | 42.75                 |
| Price spread                                   | 712.50     | 50.89                 |

Source: Field survey

### Marketing Cost, Marketing Margin and Price Spread of Channel V for Sugarcane

In marketing channel V of sugarcane farmers, wholesaler and retailer were market functionaries. Farmer sold sugarcane to wholesaler. From Table 5, it can be concluded that producer's marketing cost comprised the costs of weighing (5.00 ₹/q) and post-harvest losses (19.00 ₹/q). Marketing cost at producer level was 24.00 ₹/q. Costs of loading and unloading (10.00 ₹/q), transportation (6.00 ₹/q), storage (2.00 ₹/q) and losses (15.20 ₹/q) were covered in marketing cost of wholesaler. Marketing cost of wholesaler was 33.20 ₹/q and marketing margin was 706.80 ₹/q. In retailer's marketing cost, costs of loading and unloading (9.00 ₹/q), transportation (14.00 ₹/q), storage (2.00 ₹/q) and losses (37.50 ₹/q) were included. Marketing cost and marketing margin of retailer was 62.50 and 837.50 ₹/q respectively. Consumer's purchase price was 2,400.00 ₹/q. Total marketing cost of channel V of sugarcane was 119.70 ₹/q. Total marketing margin was 1,544.30 ₹/q. Price spread was 1,664.00 ₹/q. 30.67 per cent was producer's share in consumer rupee. 31.67 per cent was wholesaler's share in consumer rupee. 62.50 per cent was retailer's share in consumer rupee. In areas where sugarcane farms were far away, Channel V was preferred.

**Table 5:** Marketing cost, marketing margin and price spread of channel V for sugarcane

| Particular                         | Cost (₹/q) | % to consumer's price |
|------------------------------------|------------|-----------------------|
| <b>Cost incurred by producer</b>   |            |                       |
| Net price received by producer     | 736.00     | 30.67                 |
| Weighing                           | 5.00       | 0.21                  |
| Post-harvest losses                | 19.00      | 0.79                  |
| Marketing cost                     | 24.00      | 1.00                  |
| <b>Cost incurred by wholesaler</b> |            |                       |
| Purchase price of wholesaler       | 760.00     | 31.67                 |
| Loading and unloading              | 10.00      | 0.42                  |
| Transportation                     | 6.00       | 0.25                  |
| Storage                            | 2.00       | 0.08                  |
| Losses                             | 15.20      | 0.63                  |
| Marketing cost                     | 33.20      | 1.38                  |
| Marketing margin                   | 706.80     | 29.45                 |
| <b>Cost incurred by retailer</b>   |            |                       |
| Purchase price of retailer         | 1,500.00   | 62.50                 |
| Loading and unloading              | 9.00       | 0.38                  |
| Transportation                     | 14.00      | 0.58                  |
| Storage                            | 2.00       | 0.08                  |
| Losses                             | 37.50      | 1.56                  |
| Marketing cost                     | 62.50      | 2.60                  |
| Marketing margin                   | 837.50     | 34.90                 |
| Consumer's purchase price          | 2,400.00   | 100.00                |
| Total marketing cost               | 119.70     | 4.99                  |
| Total marketing margin             | 1,544.30   | 64.35                 |
| Price spread                       | 1,664.00   | 69.33                 |

Source: Field survey

### Marketing Cost, Marketing Margin and Price Spread of Channel VI for Sugarcane

From Table 6 it can be described that in Channel VI marketing cost incurred by producer and retailer were 23.75 ₹/q and 51.25 ₹/q respectively. Hence, total marketing cost was 75.00 ₹/q. In producer's marketing cost, costs of weighing (5.00 ₹/q) and post-harvest losses (18.75 ₹/q) were included. In retailer's marketing cost, costs of loading and unloading (10.00 ₹/q), transportation (9.00 ₹/q), storage (3.00 ₹/q) and losses (29.25 ₹/q) were included. Total marketing margin was 498.75 ₹/q and price spread was 573.75 ₹/q for Channel VI of sugarcane. Net price received by producer was 726.25 ₹/q and 55.87 per cent was producer's share in consumer rupee. 57.69 per cent was retailer's share in consumer rupee. Consumer's purchase price was 1,300 ₹/q. In areas, where the proximity between producer and retailer was closer, Channel VI was the preferred choice.

**Table 6:** Marketing cost, marketing margin and price spread of channel VI for sugarcane

| Particular                       | Cost (₹/q) | % to consumer's price |
|----------------------------------|------------|-----------------------|
| <b>Cost incurred by producer</b> |            |                       |
| Net price received by producer   | 726.25     | 55.87                 |
| Weighing                         | 5.00       | 0.38                  |
| Post-harvest losses              | 18.75      | 1.44                  |
| Marketing cost                   | 23.75      | 1.83                  |
| <b>Cost incurred by retailer</b> |            |                       |
| Purchase price of retailer       | 750.00     | 57.69                 |
| Loading and unloading            | 10.00      | 0.77                  |
| Transportation                   | 9.00       | 0.69                  |
| Storage                          | 3.00       | 0.23                  |
| Losses                           | 29.25      | 2.25                  |
| Marketing cost                   | 51.25      | 3.94                  |
| Marketing margin                 | 498.75     | 38.37                 |
| Consumer's purchase price        | 1,300.00   | 100.00                |
| Total marketing cost             | 75.00      | 5.77                  |
| Total marketing margin           | 498.75     | 38.37                 |
| Price spread                     | 573.75     | 44.14                 |

Source: Field survey

### Marketing Efficiency of Different Marketing Channels for Sugarcane

Market performance is measured by marketing efficiency. Table 7 shows the consumer's price, producer's net price, marketing cost, marketing margin, price spread and marketing efficiency of different channels. According to table 7, channel V's consumer purchase price was the highest among all the channels. Producer's net received price was the highest in channel IV. Marketing cost of channel V was the highest. Marketing margin of channel V was the highest. Marketing efficiency of channel III was the highest followed by channel I, channel II, channel VI, channel IV and channel V. In channel I, channel II and channel III there were no market intermediaries. Mostly farmers preferred channel I because other channels lacked a guarantee from buyers to purchase sugarcane from them.

**Table 7:** Marketing efficiency of different marketing channels for sugarcane

| Particular (₹/q)              | Channel I | Channel II | Channel III | Channel IV | Channel V | Channel VI |
|-------------------------------|-----------|------------|-------------|------------|-----------|------------|
| Consumer's purchase price     | 312.50    | 285.00     | 750.00      | 1,400.00   | 2,400.00  | 1,300.00   |
| Producer's net received price | 295.25    | 268.05     | 727.75      | 737.50     | 736.00    | 726.25     |
| Marketing cost                | 32.59     | 34.23      | 64.88       | 114.00     | 119.70    | 75.00      |
| Marketing margin              | 0         | 0          | 0           | 598.50     | 1,544.30  | 498.75     |
| Price spread                  | 32.59     | 34.23      | 64.88       | 712.50     | 1,664.00  | 573.75     |
| Marketing efficiency          | 8.59      | 7.33       | 10.56       | 0.96       | 0.44      | 1.27       |

Source: Field survey

### Conclusion

The study revealed that six marketing channels existed in Gujarat for sugarcane. Among all the channels, channel I was the most preferred by the farmers. From all the channels, the most efficient channel was channel III comprising of farmer- sugarcane juice centre in which producer's share in consumer's rupee was 97.03 per cent. Price spread was the highest in channel V.

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