

Economics of Chemical Free Jaggery Production in Kolhapur District of Maharashtra

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(Received : 04.09.2024 Accepted : 31.03.2025)

Abstract

India is the largest producer of the sweeteners in the world including sugar and jaggery. Since ancient times, jaggery has been an important item of food and even today, jaggery manufacturing continues to be the most important cottage industry in India. The present investigation was undertaken to examine the production cost, marketing channels, marketing cost of jaggery. The primary data pertaining to the agricultural year 2022-23 were collected from 20 jaggery processing units each from Karveer and Panhala tahsils of Kolhapur district. The simple random sampling technique was used for selection of the 40 jaggery processing units. The average cost of establishment of jaggery processing unit was Rs. 8,33,188.90. The total cost of jaggery production per processing unit was Rs. 38,45,644.37. The return from jaggery production per processing unit was Rs. 47,93,800 with a net return of Rs. 9,48,155.63. The B:C ratio was found to be more than one which implies that it was profitable to the investment in jaggery processing activities. The major constraints faced by the jaggery producers were scarcity of skilled labour (Gulvi), high wages of labour, timely availability of clarifying agents, shortage of raw material (sugarcane) and lack of training on advanced technology of jaggery production.

Key words : Costs, returns, production, methodology, constraints, jaggery production.

Sugarcane occupies a very prominent position on the agricultural map of India. Historically origin of Sugarcane Spp. *Saccharum barberi* is India and of *Saccharum officinarum* is New Guinea. Sugarcane is known to be thriving well in Brazil, India, Australia, Cuba, USA, Philippines, USSR and Indonesia. Sugarcane is the main raw material required for the sugar and jaggery industries. India is the largest producer of the sweeteners in the world including sugar and jaggery. Since ancient times, jaggery has been an important item of food and even today; jaggery manufacturing continues to be the most important cottage industries in India. The jaggery industry occupies a prominent place in the sugar economy, as it consumes 20.15 per cent of the total sugarcane grown in India. Market for jaggery is round the year whereas its production is only during the sugarcane harvest season and thus factory works for around 6 to 7 months every year. The India packaged jaggery

market size reached Rs. 55.6 billion in 2022. Looking forward, IMARC Group expects the market to reach Rs. 122.1 billion by 2028, exhibiting a growth rate (CAGR) of 14.10 per cent during 2023-2028. The jaggery and Khandsari industry in India is equally important to that of sugar industry. In India during the last couple of years has produced more than 300 MMT of sugarcane out of which, about 80 per cent is utilized for producing white sugar, 11.29 per cent in producing jaggery and Khandsari, 8.80 per cent as cane juice, seed cane for the next harvest etc during 2017-18. Sugar and Jaggery (popularly known as gur) are well known as the most valued, traditional sweetener primarily obtained from sugarcane. The rising demand for sweeteners has brought focus on Jaggery, an important cottage industry in economies of the nation for their implications on employment and income. As a traditional sweetener, Jaggery is produced in small units

using local machinery in rural areas. Jaggery is produced nearly in 25 countries with a total production of about 13 million tonnes per year. India is the largest producer of Jaggery under an unorganised agro-processing sector, sharing 55 per cent of the total world production, followed by Colombia (11%)

Study area : The Kolhapur district was purposively selected for the present study due to the fact maximum numbers (702) of jaggery producing units are present in the area and two tehsils from the selected district had been selected purposively on the basis of maximum number of jaggery processing units for the present study. On the basis of maximum jaggery processing units in Karveer and Panhala has 387 and 194 jaggery production units, respectively and were found promising in production of jaggery, for this reason the study was undertaken in above mentioned tehsils of Kolhapur district.

Materials and methods

The present study was undertaken in Karveer and Panhala tahsils of Kolhapur district of Maharashtra state, from these two tahsil 4 villages were purposively selected on the basis of having large area under sugarcane cultivation. The data was collected with the structured interview schedule from randomly selected 40 farmers. The data were tabulated and processed through the primary and secondary tables. Frequency and percentage analysis were used to study the extent of adoption of the respondents on jaggery production technology. For estimating the effect of various factors in

receiving the net price per quintal, the following multiple regression model will be fitted to the data. Marketing channels of jaggery are the routes through which the jaggery moves from jaggery producers to jaggery consumers. They were identified by interviewing the selected respondents and other 5 intermediaries involved in different marketing channels. Commission agents, wholesalers and retailers were preferred randomly for study marketing cost and price spread in various marketing channels.

Results and discussion

Costs and returns : From the Table 2 results further indicated that, on an average, 1089.50 quintals of jaggery were produced annually. The total cost amounts to Rs. 3845644.37 with 99.31 per cent of this being variable costs and only 0.69 per cent being fixed costs, indicating that the production process is highly dependent on fluctuating inputs like raw materials and labour.

Land rent (Rs. 11825) was a significant fixed cost, covered the expense of leasing the land used for construction of shed of jaggery unit.

Depreciation on machinery and equipment (Rs. 6153.96) represented the gradual decrease in value of machinery over time due to wear and tear, which must be factored into total fixed costs. Interest on fixed capital (Rs. 8331.89) Assumed a 10% interest rate, this was the cost of capital invested in fixed assets (e.g., equipment, land), calculated as a percentage of the total fixed capital. Total Fixed Cost (Rs. 26310.85) cost was relatively low compared to variable costs, showing that the primary financial burden comes from the production process itself. Raw material cost (Rs. 3111195.52) was the largest component of the variable cost, making up the bulk of production expenses, with purchased sugarcane being particularly costly. Bhendi powder (Rs. 2257), lime (Rs. 3742), edible oil (Rs. 6510), and Vafa powder (Rs.

Table 1. Tehsil wise selection of the jaggery producers

District	Tahsils	No. of sample jaggery producers
Kolhapur	Karveer	20
	Panhala	20
Total		40

11615), which were essential for processing sugarcane into jaggery. These costs were relatively minor compared to raw material (sugarcane). Gulvi (Rs. 46725), Cane harvest (Rs. 271810), Cane transport (Rs. 8060), Cane crushing (Rs. 256409), and Female labour (Rs. 49446). Labour represented a significant portion of variable costs, particularly for harvesting and crushing. Total cost (Rs.

3845644.37) was the sum of fixed and variable costs. The majority of the total cost came from variable expenses, particularly the purchase of sugarcane and labour. The net return realized in jaggery processing was to the tune of Rs. 948155.63. Jaggery production of 1089.50 quintals yields a revenue of Rs. 4793800, leading to net returns of Rs. 948155.63. The cost per quintal of jaggery was Rs. 3529.73.

Table 2. Costs and return from jaggery processing unit (2022-23)

Particulars	Quantity	Costs	Percent to total cost
Fixed cost			
Land rent	0.06	11825.00	0.31
Depreciation on machinery and equipment	-	6153.96	0.16
Interest on fixed capital (10%)	-	8331.89	0.22
Total fixed cost		26310.85	0.69
Variable cost			
Raw material cost - Sugarcane (Tonnes)			
a) Own sugarcane	229.43	586548.77	15.25
b) Purchased sugarcane	870.57	2524646.75	65.65
Subtotal	1100.00	3111195.52	80.90
Clarifying agent cost			
a) Bhendi powder (kg)	5.97	2257.00	0.06
b) Lime (kg)	367.70	3742.00	0.10
c) Edible oil (50 gm per packet)	434.00	6510.00	0.17
d) Vafa powder (kg)	32.44	11615.00	0.30
Subtotal		24124.00	0.63
Labour cost			
a) Gulvi (man days)	108.50	46725.00	1.21
b) Cane harvest (man days)	1087.24	271810.00	7.07
c) Cane transport	-	8060.00	0.21
d) Cane crushing (man days)	1025.64	256409.00	6.67
e) Female labour (man days)	329.66	49446.00	1.28
Subtotal		632415.00	16.44
Fuel and electricity charges	-	47300.00	1.23
Khadi cloths	-	4300.00	0.11
Total variable cost		3819333.52	99.31
Total cost		3845644.37	100.00
Returns			
Jaggery produced (Quintal)	1089.50	4793800.00	
Net returns		948155.63	
Per quintal cost of jaggery		3529.73	
B:C Ratio		1.25	

The Benefit-Cost (B:C) ratio of 1.25 suggests a profitable venture, with every Rs. 1 invested yielding a return of Rs. 1.25. These findings confirmed with the result of Koli M. B. (2021) and Mori B.R. (2022).

Marketing of jaggery

Price spread in marketing of jaggery :

Price spread refers to the difference between the price paid by the consumer (processor) and price received by the producer for a unit quantity of farm produce. Price spread consists of marketing costs and margins of the intermediaries which ultimately determine the overall efficiency of marketing system. Since all the produce was sold through two identified marketing channels, these two marketing channels were considered for estimation of price spread. The channel wise price spread and market margins of the intermediaries involved in marketing of jaggery is presented in Table 3.

It can be seen that the average per quintal retail price was Rs. 119.67 in Channel I and Rs. 6424.25 in Channel II. In Channel I, the producer received 65.98 per cent of the price paid by the consumer. The producers incurred the expenses to the extent of 3.67 per cent. The expenditure incurred by the wholesaler and retailer for channel I was 8.95 and 2.07 per cent, whereas, the margin of both market functionaries was 10.24 and 9.09 per cent, respectively. Here, it is also quite clear that the wholesaler realized comparatively more margin in proportion to the cost incurred in channel II, the producer received 66.42 per cent of price paid by consumer. The producer incurred the expenses to the extent of 4.22 per cent. The expenditure incurred by the wholesaler and retailer was 8.59 and 2.00 per cent, whereas, the margin of both market functionaries was 8.97 and 9.80 per cent, respectively. Here, it was quite clear that the retailer realized comparatively more margin in proportion to the cost incurred.

Table 3. Channel wise price spread of jaggery (2022-23)
(Rs. q⁻¹)

Items of marketing cost	Channel I (P-W-R-C)	Channel II (P-DW-R-C)
Net price received by producer	4037.46 (65.98)	4266.87 (66.42)
Marketing expenses incurred by producer	224.54 (3.67)	271.13 (4.22)
Price paid by wholesaler	4262	4538
Expenses incurred by wholesaler	547.99 (8.95)	551.95 (8.59)
Margin of wholesaler	626.47 (10.24)	576.38 (8.97)
Price paid by retailer	5436.46	5666.33
Expenses incurred by retailer	126.86 (2.07)	128.58 (2.00)
Margin of retailer	556.35 (9.09)	629.34 (9.80)
Price paid by consumer (Retailer sale price)	6119.67 (100.00)	6424.25 (100.00)
Price spread	2082.21	2157.38
Producer's share in consumer's rupee	69.64	70.64

The producer's share in consumer's rupee was comparatively highest in Channel-II i.e. 66.42 per cent compare to Channel-I 65.98 per cent. This clearly indicated that, Channel-II was found to be slightly more efficient channel in marketing of jaggery in Kolhapur district.

Thus, from the above discussion the proposed alternative hypothesis put forth as the producer's share in consumer's prices was maximum in most efficient Channel (i.e. Channel II) was proved. These findings confirmed with the result of Koli M. B. (2021) and Mori B.R. (2022).

Suggestions

Jaggery production units are found to be economically viable and there is need to encourage more jaggery units in sugarcane cultivating area. Quality jaggery fetches higher net returns. For ensuring good quality jaggery all required efforts are needed. Therefore, there is

a need to undertake research on priority basis for technology up gradation of jaggery units for increased efficiency and jaggery outturn. There is need to develop storage facility for jaggery in jaggery producing area and on APMC. During the peak season, there is more supply of jaggery in market which adversely affect prices as a result of a periodical glut causing wide price fluctuations. The benefit of storage, therefore, can be taken jaggery producers. The jaggery producers shall be motivated to take the benefit of e-NAM activity started in Kolhapur APMC for maximizing the profit from the sale of jaggery.

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