Economics of paper sweet making units in Dr.B.R.Ambedkar Konaseema district of Andhra pradesh

ABSTRACT

The present study examines the economics and constraints of paper sweet-making units in Atreyapuram Mandal of Dr. B.R. Ambedkar Konaseema District, Andhra Pradesh. Data were collected from 15 micro and 15 macro units using purposive random sampling. The economic analysis highlights the financial viability of these units, with both categories showing positive Net Present Value (NPV) and Benefit-Cost Ratios (BCR) exceeding one. The Internal Rate of Return (IRR) stood at 51.19% for micro units and 67.98% for macro units, indicating substantial profitability. Macro units, benefiting from larger production capacities and investments, were more profitable than micro units.The break-even production level was 7,559.6 boxes for micro units and 7,598.7 boxes for macro units, with actual production levels averaging < 30,000 boxes and > 30,000 boxes, respectively. Despite their profitability, paper sweet-making units face challenges such as inconsistent raw material supply, labor shortages, inadequate credit access, and quality control issues. Marketing constraints, including seasonal demand fluctuations and low-profit margins, further hinder growth.

Keywords: paper sweet ; NPV; BCR; IRR

1. INTRODUCTION

Atreyapuram, a village in Dr. B.R. Ambedkar Konaseema District of Andhra Pradesh, is renowned for its traditional sweet, Pootharekulu, also known as paper sweet. This delicacy holds cultural significance in the Telugu-speaking states, where it is an essential part of festivals and celebrations. Beyond its symbolic value, Pootharekulu has gained national recognition, particularly after receiving a Geographical Indication (GI) tag. This certification has helped preserve its traditional methods and boosted its market potential, making it a proud symbol of Andhra Pradesh's heritage.

The preparation of Pootharekulu involves crafting wafer-thin rice starch sheets, filled with sugar, ghee, and dry fruits, and folding them with precision. This intricate process sustains the livelihoods of many families in Atreyapuram, particularly women, who form the backbone of this cottage industry. In addition to its unique preparation, the sweet offers nutritional benefits, particularly when prepared with jaggery and nuts, making it a healthier alternative to conventional sweets.

2. LITERATURE REVIEW

Raj kumar *et al.* (2023) in their study on constraints in production, marketing, and processing of tomato in Nuh district of Haryana, inferred that the major problems faced by the respondents were unavailability of technical manpower, higher rate of charges power and fuels, problems in the arrangement of finance, fluctuation in raw material and procurement, lack of good quality packaging material.

Goswami and singh (2023) in their study on the constraints faced by the Khoya producers in production and marketing of Khoya, in Almora District of Uttarakhand. They identified lack of knowledge, regarding cattle diseases, lack of veterinary services, post-preparation loss, low prices received from collectors and delayed payment.

Prasanthi (2023) studied on the economics of mango jelly making units in Kakinada district of Andhra Pradesh reveals that the overall break-even output was 1.43 tonnes in unorganized and 15.13 tonnes in organized units, while the actual production was 19 and 56.25 tonnes, indicating that the mango jelly making units in the study area were working at a level above the break-even output production. Break-even point was Rs. 1,25,902 (organized) and Rs. 13,99,892 (unorganized). The actual production under both the categories was significantly higher than the production level required to break even.

Sekhar *et al.* (2022) studied on economic analysis of production of sweet orange in Ananthapuramu District. The results showed that the net present value, benefit-cost ratio, and internal rate of return were Rs. 2192536.87per hectare, 3.04 and 23.6 per cent. The findings of the study show that sweet orange was a profitable and promising enterprise for the drought prone district of Andhra Pradesh state.

Dubey *et al.* (2019) examined the value chain dynamics of mango in Pratapgarh district, Uttar Pradesh. Their study indicated that mango production is profitable (BCR = 4.12:1), with an average production cost of Rs. 93,100 per hectare and a net return of Rs. 3,84,020 per hectare. Producers incur the majority of the costs, at 82.27 per cent, followed by wholesalers (9.71%) and retailers (8.02%).

Adams *et al.* (2019) in their study on financial analysis of small-scale mango chip processing in Ghana, showed the results that the total capital expenditure to establish a small-scale mango chip enterprise was Gh₵5, 638.60 (US$1,127.72) with an operating cost of Gh₵12, 100 (US$2,400). Using an opportunity cost of capital of 27 per cent, the result revealed NPV of Gh₵7,392.60 (US$1,478.52), BCR of 1.18 and an IRR of 77 per cent. The payback period was 1 year and 5 months. These financial indicators suggest that investment in small scale mango chips was profitable and viable.

Mahantesh and paled (2018) conducted study on An economic analysis of cashewnut production in Konkan region of Maharashtra ,their results were the Net Present Values at 12 per cent discount rate for the entire life period of the cashew (20 years) were positive for both Ratnagiri and Sindhudurga districts and the NPV was found to be highest in Ratnagiri (Rs. 9,72,207) than in Sindhudurga (Rs. 11,38,561). The Benefit cost ratio was 3.95in Ratnagiri and 3.86 in Sindhudurga. However, the ratios were greater than unity for both the districts indicating remunerative returns per rupee of investment in cashew. The internal rate of returns was found to be 65.68 percent in Ratnagiri, while in Sindhudurga, it was 68.73 percent. In both the districts, the internal rate of return was observed to be above the current bank rate and it was higher in Sindhudurga compared to Ratnagiri.

Dolapo *et al.* (2016) studied the production constraints of grain slurry processing. They revealed that the strenuous nature of grain slurry processing, high labor costs, and lack of specialized markets and machinery for most of the operations were the major bottlenecks facing the processors. Market-related constraints were the lack of a reliable market in which processing industry could sell their produce or poor road infrastructure in some areas, which resulted in high transportation costs leading to poor sale.

Datarkar *et al.* (2014). Conducted a study on Economic processing of mango in Gadchiroli district of Maharastra ,their results shows that the calculation of cost and returns which was worked out on 100 kg. of mango. Total cost incurred for the preparation of amchur was recorded as Rs. 3934.77 per 100 kg. Total variable cost also indicated same trend with a contribution of 7.99 per cent. Among

the variable cost, raw material cost was a major cost concern contributing 38.75 per cent followed by polythene bags 16.77 per cent and labour cost 9.14 per cent. Fixed cost formed the major concern for selected units to the extent of 17.60 per cent in total cost because of under utilization of its processing capacity. On an average, amchur incurred total cost of Rs.3,934.77, of which total variable cost was Rs.2872.10, fixed cost was Rs.692.67 and total marketing cost was Rs.370 with a gross receipt of Rs.13200 (per 110 kg), net returns of Rs.9,265.23 were good. The benefit cost ratio was 1:2.35.

Karthick *et al.* (2013) in their study on mango pulp processing Industry in Tamil Nadu-An economic analysis. They observed that the net return per kilogram of pulp was Rs. 3.61. The net present value for mango pulp industry was Rs. 836.01 Lakhs, benefit-cost ratio (1.42) and IRR (22.93 %) indicating that investment on mango processing was financially viable.

Naik (2005) in his study observed that, per factory investment was Rs. 4.69 lakhs, Rs.11.61 lakhs, Rs.16.01 lakhs, and Rs. 177.27 lakhs respectively in Home-scale, Cottage scale, Small-scale and Large-scale. At overall level per factory total capital investment was Rs 19.77 lakhs, of which 17.66 per cent was fixed capital and 82.34 per cent was the working capital.

3. METHODOLOGY

This study was conducted in Atreyapuram Mandal of Dr. B.R. Ambedkar Konaseema District, Andhra Pradesh, a region renowned for its Pootharekulu (paper sweet) production. The purposive sampling technique was employed to select 30 paper sweet-making units, comprising 15 macro units (annual production of approximately 40,000 boxes) and 15 micro units (annual production of approximately 25,000 boxes).

3.1 Net Present Worth (NPW)

It is sometimes referred to as net present value. It is the present worth of the incremental net benefits or incremental cash flow stream. The selection criterion of the project depends on the positive value of the net present worth when discounted at the opportunity cost of the capital.

Net present worth of the project (NPW) is estimated using the following formula.

$$NPW=\sum_{j=1}^{n}\frac{B_j-C_j}{(1+i)^j}$$

where Bj = Benefits in jth year
Cj = Costs in jth year
i = Discount rate
n = Number of years

A positive NPV indicates economic viability

3.2 Benefit-Cost ratio (BCR)

This ratio compares the present worth of costs with present worth of benefits. The common procedure of selecting the project is to choose the projects having the B:C ratio of more than one, discounted at opportunity cost of capital.

This ratio was arrived by using the following formula.

$$BCR=\sum_{j=1}^{n}\frac{\frac{B_j}{(1+i)^j}}{\frac{C_j}{(1+i)^j}}$$

Where Bj = Benefits in rupees in jth year
Cj = Costs in rupees in jth year
I = Discount rate
n = Number of years

3.3 Internal Rate of Return (IRR)

It represents the average earning capacity of an investment over the economic life period of the project. It is the discount rate at which the present values of cash flows are just equal to zero i.e., NPW = 0. In other words, the benefit cost ratio calculated at IRR is unity.

Mathematically, it can be represented as

Where Bj = Benefits in rupees in jth year
Cj = Costs in rupees in jth year
i = Discount rate
n = Number of years
I = Initial investment

When the calculated IRR is greater than the market rate of interest, then the investment in the project is considered viable and worthy.

3.4 Break-Even Analysis (BEA):

At break-even point the producer gets neither loss or profit. To know the minimum level of turnover of a commercial paper sweet making units, break-even point in value terms and break-even output in physical terms were calculated.

The break-even output was calculated using the formula

$$\text{Break-even output} = \frac{\text{Total fixed cost}}{\text{Selling price per unit - Variable cost per unit}}$$

The break-even point was calculated using the formula

$$\text{Break even point} = \frac{\text{Total fixed cost}}{1-\frac{V}{S}}$$

Where v = variable cost per unit

S= selling price per unit

3.5 Garrett Ranking technique

The study utilized Garrett's Ranking Technique to prioritize the constraints faced by paper sweet-making units. This method is particularly effective for converting subjective rankings into quantitative scores, enabling the identification of the most critical challenges.

$$\text{Per cent position} = \frac{100\left(R_{ij} - 0.5\right)}{N_j}$$

Where, Rij = Rank given for the ith variable by jth respondents

Nj = Number of variables ranked by jth respondents

4. RESULT AND DISCUSSION

4.1 Viability of Paper Sweet Making Units

The economic viability of paper sweet-making units in Atreyapuram Mandal was evaluated using financial indicators like Net Present Value (NPV), Benefit-Cost Ratio (BCR), Internal Rate of Return (IRR), and Break-Even Analysis. From table 1 revealed that both macro and micro units are economically sustainable across different scenarios. At a 15% discount rate, the NPV for macro units was 1,39,908.53, while micro units reported ₹62,329.88. As the discount rate increased to 20% and 25%, the NPVs for macro units reduced to ₹1,02,222.12 and ₹74,853.55, respectively, while micro units recorded ₹42,406.90 and ₹27,952.25. These positive NPVs at all discount rates highlight the economic feasibility of paper sweet-making units. Benefit-Cost Ratio (BCR) further confirms profitability, with values exceeding 1 across all discount rates. For macro units, the BCR was 1.28, 1.25, and 1.22 at 15%, 20%, and 25% discount rates, respectively. Similarly, micro units exhibited BCR values of 1.14, 1.12, and 1.09. This indicates that every rupee invested generates returns greater than the cost, making the units economically viable. Internal Rate of Return (IRR) analysis showed that macro units achieved an IRR of 67.98%, while micro units reported 51.19%. These rates are significantly higher than the applied discount rates, reaffirming the profitability of the investments. Macro units, with their larger production capacities and broader market reach, demonstrated higher financial performance than micro units.

Table 1. Economic viability of Paper Sweet Making Units

Particulars	Discount rates(%)		
	15	20	25
	Macro units		
NPV (Rs.)	139908.53	102222.12	74853.55
B-C ratio	1.28	1.25	1.22
IRR(%)	67.98		
	Micro units		
NPV(Rs.)	62329.88	42406.90	27952.25
B-C ratio	1.14	1.12	1.09
IRR(%)	51.19		

Karthick et al. (2013) reported similar results in their study that the net return per kilogram of pulp was Rs. 3.61 and net present value for mango pulp industry was Rs. 836.01 Lakhs, benefit-cost ratio (1.42) and IRR (22.93 %) indicating that investment on mango processing was financially viable.

Prasanthi (2023) reported similar findings in her study on the economics of mango jelly making units in Kakinada district of Andhra Pradesh.

4.2 Break even analysis

Break-even analysis was conducted to determine the minimum number of boxes required to be produced by paper sweet-making units to operate on a no-profit, no-loss basis. From the table 2, it was observed that macro units needed to produce a minimum of 7,598.7 boxes, while micro units required 7,559.6 boxes to break even. The financial buffer above the break-even point, was higher for macro units at Rs.1,519,757 compared to Rs. 1,133,955 for micro units.

Table 2. Break-even analysis

Particulars	Macro	Micro
Price per box	200	150
Variable cost per box	122.3	102.7
Total fixed cost	590425.6	357157.9
Break even output(boxes)	7598.7	7559.6

Break even point(Rs.)	1519757	1133955

Datarkar (2014) got similar results in his research on the break-even quantity of the produce mango pickle and amchur, which were 6 and 7.27 kg, respectively.

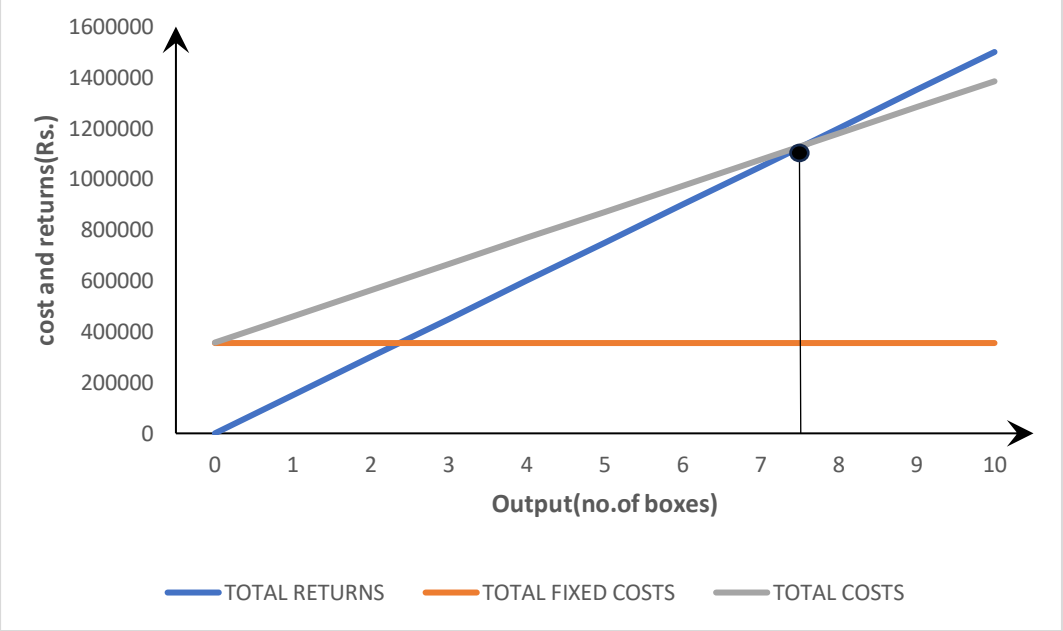

Fig 1. Break-even output for micro paper sweet making units

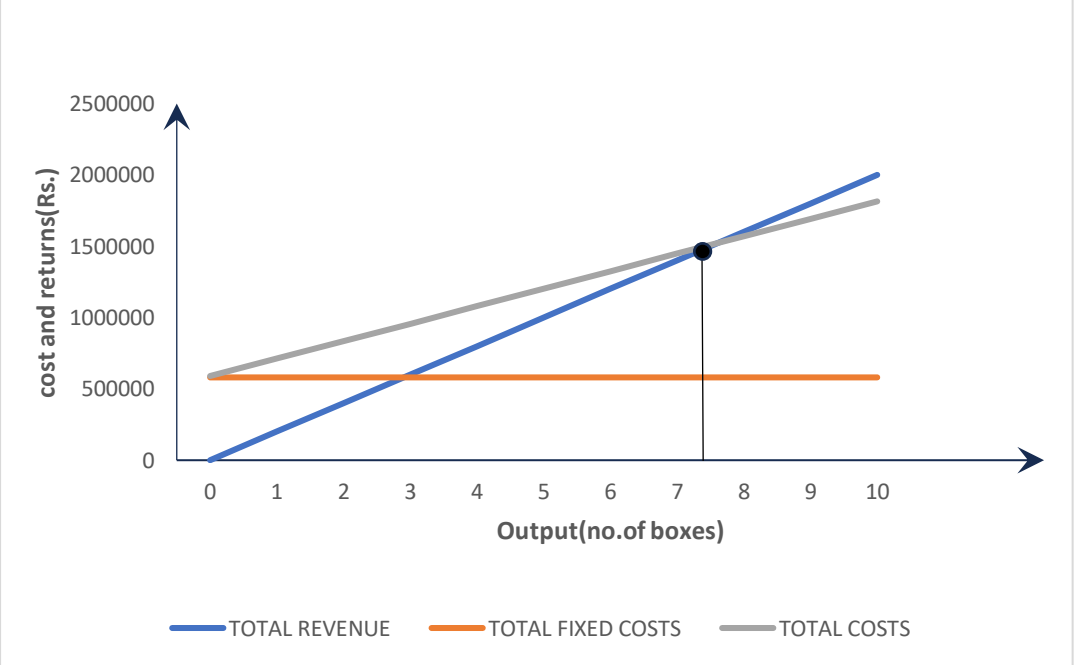

Fig 2. Break-even output for macro paper sweet making units

4.3 Constraints

The paper sweet-making units were studied to determine the constraints in their processing and marketing processes. It was observed from the analysis that quality control was the most critical processing constraint, with a mean score of 59.77. This was followed by raw material availability, which

ranked second with a mean score of 56.53. Labor shortages were ranked as the third constraint with a mean score of 50.77, while inadequate credit support ranked fourth with a mean score of 50.67. High working capital requirements, insufficient government support, high costs of raw materials, and expensive equipment maintenance were ranked fifth, sixth, seventh, and eighth, with mean scores of 47.40, 44.17, 41.13, and 34.73, respectively.

In terms of marketing constraints, access to markets was ranked as the most significant challenge, with a mean score of 65.60. Seasonal demand fluctuations were ranked second with a mean score of 57.10, followed by low profit margins, ranked third with a mean score of 52.90. Duplicate products and market competition were ranked fourth and fifth, with mean scores of 52.40 and 43.93, respectively, while high transportation costs were ranked sixth with a mean score of 28.40.

Table 3. Production and Marketing constraints

Constraints	Per cent position	Rank
Processing		
Quality control	59.77	I
Raw material availability	56.53	II
Labour availability	50.77	III
Inadequate credit support	50.67	IV
High working capital	47.40	V
Inadequate government support	44.17	VI
High cost of raw materials	41.13	VII
High cost of equipment maintenance	34.73	VIII
Marketing		
Access to markets	65.60	I
Seasonal demand fluctuations	57.10	II
Low profits margin	52.90	III
Duplicate products	52.40	IV
Market competition	43.93	V
High transportation cost	28.40	VI

Raj kumar (2023) in his study on constraints in production, marketing and processing of tomato in Nuh district of Haryana he found that the arrangement of finance, price fluctuation in raw material and procurement were the major problems.

Dolapo's (2016) study on trends and constraints of Grain Slurry Food Processing in Kaduna State, The major constraint he found was lack of reliable market in marketing the produce.

5. CONCLUSION

The study highlights the economic viability of paper sweet-making units in Atreyapuram Mandal, with macro and micro units demonstrating profitability. Macro units achieved better financial performance, with an IRR of 67.98%, a BCR of 1.28, and higher NPVs across all discount rates. Micro units, operating on a smaller scale, were also profitable, with an IRR of 51.19% and a BCR of 1.14 at a 15% discount rate. Break-even analysis showed that macro units required 7,598.7 boxes to break even, while micro units needed 7,559.6 boxes, confirming the sustainability of both scales of production.Despite their profitability, these units face significant challenges. Quality control, raw material availability, and labor shortages were identified as the most critical production constraints, while limited market access and seasonal demand fluctuations were the primary marketing challenges. Addressing these issues through improved supply chain management, financial assistance, and better market linkages can enhance their operational efficiency and profitability. The findings underscore the potential of traditional industries like Pootharekulu in preserving cultural heritage while contributing to rural livelihoods. Strategic interventions are essential to support the growth and sustainability of this industry, ensuring its continued contribution to the region's economy.

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