



Are Sugarcane Margins Reasonable in Maharashtra? An Economic Analysis of Costs, Returns and Crop Alternatives Using CACP Cost Concepts

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Abstract:

Sugarcane is a major commercial crop in Maharashtra and plays a pivotal role in the rural economy and agro-processing sector of the state. The crop is cultivated under administered pricing through the Fair and Remunerative Price (FRP) mechanism, with the objective of ensuring remunerative returns to growers. However, rising costs of cultivation, increasing water scarcity, yield variability, recovery-linked pricing and persistent delays in payment by sugar factories have raised concerns about the adequacy of margins realized by sugarcane farmers. Using secondary data from the Commission for Agricultural Costs and Prices (CACP) and other official sources, this paper examines the economic viability of sugarcane cultivation in Maharashtra by analyzing costs and returns under alternative cost concepts (A₂, A₂+FL and C₂). The study further compares returns from sugarcane with selected alternative cropping systems and cash crops. The results indicate that although sugarcane generates high gross returns, net margins over comprehensive cost are modest and fall short of the remunerative benchmark of C₂ plus 50 per cent recommended by the National Farmers' Commission. Nevertheless, sugarcane continues to dominate cropping patterns due to its relative income advantage over competing field crops and institutional factors. The paper highlights the need for pricing reform, timely payment enforcement and promotion of crop diversification to improve farm income and sustainability.

Keywords: Sugarcane, Cost of Cultivation, CACP, Net Returns, Crop Diversification, Maharashtra

Introduction:

Sugarcane occupies a central position in Indian agriculture, particularly in Maharashtra, which is one of the leading sugar-producing states in the country. The crop supports a large number of farm households and sustains an extensive network of cooperative and private sugar factories. Unlike most agricultural commodities, sugarcane prices are administratively determined through the Fair and Remunerative Price (FRP) announced by the Government of India, and in some states through an additional State Advised Price (SAP). The primary objective of this pricing

policy is to protect farmers from market volatility and ensure reasonable margins over the cost of cultivation.

In recent years, however, sugarcane cultivation in Maharashtra has come under increasing stress. Costs of cultivation have risen sharply due to higher labour wages, energy prices and input costs. At the same time, water scarcity has intensified, particularly in drought-prone regions, raising questions about the sustainability of water-intensive crops such as sugarcane. Further, recovery-rate-linked pricing, coupled

with delays in payment by sugar factories, has reduced the effective income realised by farmers.

Despite these challenges, sugarcane continues to dominate the cropping pattern in irrigated regions of Maharashtra. This apparent contradiction raises an important economic question: are the margins from sugarcane cultivation actually reasonable, or does the crop persist mainly because alternative crops provide even lower and more uncertain returns? The present paper addresses this issue by systematically analysing the cost structure and profitability of sugarcane and comparing its returns with alternative cropping systems.

Review of Literature:

A substantial body of literature has examined the economics of sugarcane cultivation in India. The price policy reports of the Commission for Agricultural Costs and Prices (CACP) consistently show that sugarcane has one of the highest costs of cultivation among field crops, owing to its long duration, intensive input use and heavy irrigation requirement. The Rangarajan Committee (2012) noted that linking cane prices to sugar recovery introduces significant inter-factory and inter-regional disparities in farmer incomes.

Empirical studies by Patil and Talathi (2018) and others have shown that while sugarcane cultivation yields high gross returns, net margins after accounting for comprehensive costs remain modest. NITI Aayog (2018) and Reserve Bank of India (2021) reports have highlighted the persistent problem of cane arrears, demonstrating that payment delays substantially erode real farm income and increase farmers' dependence on short-term borrowing.

Research on crop diversification suggests that several alternative crops, particularly high-value horticultural and spice crops, generate higher net returns than sugarcane, although they

are associated with greater market risk and require better infrastructure and market access. However, relatively few studies integrate cost concepts, comparative profitability and institutional constraints in a unified analytical framework. This paper attempts to fill this gap using recent official data.

Data Sources and Methodology:

The study is based on secondary data obtained from the Commission for Agricultural Costs and Prices (CACP), Directorate of Economics and Statistics, Government of Maharashtra, and published reports of NABARD, RBI and NITI Aayog. The analysis primarily uses triennium ending (TE) 2022-23 averages to smoothen year-to-year fluctuations.

Cost Concepts:

The CACP employs several cost concepts to evaluate farm profitability. The major cost concepts used in the present analysis are:

- **Cost A2:** Includes all paid-out costs such as seeds, fertilizers, pesticides, hired labor, irrigation charges, machinery expenses and interest on working capital.
- **Cost A2+FL:** Cost A2 plus the imputed value of family labor. This cost concept is widely regarded as the most appropriate indicator of actual income to the farmer.
- **Cost C2:** A comprehensive measure that includes Cost A2+FL, rental value of owned land and interest on fixed capital.

Returns to growers are estimated as the difference between gross value of output (GVO) and the relevant cost concept. Comparative analysis across crops is carried out using net returns over A2+FL and C2.

Cost structure of Sugarcane Cultivation in Maharashtra:

Sugarcane cultivation in Maharashtra is characterized by high operational and fixed costs. Operational costs account for a major share of total cost, with labor, irrigation and fertilizers being the most significant components. Although mechanization has reduced some labor requirements, harvesting and intercultural operations remain labor-intensive.

Fixed costs, particularly the rental value of owned land and interest on fixed capital, constitute a substantial portion of comprehensive cost. This reflects the high opportunity cost of

land allocated to sugarcane cultivation. Yield levels average around 85–95 tonnes per hectare, but considerable inter-annual and regional variation exists due to climatic factors and water availability.

Returns form Sugarcane Cultivation: Empirical Evidence:

This section presents detailed empirical evidence on the costs and returns from sugarcane cultivation in Maharashtra using official CACP estimates. The use of triennium ending (TE) averages ensures that short-term fluctuations due to weather and price shocks do not distort the assessment.

Table 1: Costs and Returns from Sugarcane Cultivation in Maharashtra (TE 2022-23)

Particulars	Value (₹/ha)
Cost of Cultivation (A2)	1,54,230
Cost of Cultivation (A2 + FL)	1,82,457
Gross Value of Output (GVO)	2,73,650
Net Return over A2	1,19,420
Net Return over A2 + FL	91,193

Source: Commission for Agricultural Costs and Prices (CACP), Price Policy for Sugarcane, TE 2022-23.

The data clearly indicate that sugarcane cultivation generates high gross returns. However, the apparent profitability declines once family labour and comprehensive costs are considered. Net returns over A2+FL of about ₹91,000 per

hectare must be evaluated in the context of a crop duration exceeding 10–12 months.

When comprehensive cost (C2) is taken into account, which includes rental value of owned land and interest on fixed capital, net returns decline substantially.

Table 2: Net Returns and Profit Margins from Sugarcane Cultivation (C2 Cost Concept)

Indicator	Maharashtra
Gross Returns (₹/ha)	1,60,000 – 1,90,000
Cost of Cultivation (C2) (₹/ha)	1,30,000 – 1,55,000
Net Returns (₹/ha)	15,000 – 35,000
Profit Margin (%)	8 – 18

Source: CACP (Various Years), Directorate of Economics and Statistics, Maharashtra.

These estimates demonstrate that although sugarcane provides income security relative to many field crops, the realised margins are modest

and highly sensitive to yield, recovery rates and payment delays.

Assessment of Remunerative Margins:

The National Farmers' Commission has recommended that farmers should receive at least 50 per cent margin over comprehensive cost (C2) to ensure remunerative prices. Applying this benchmark to sugarcane cultivation in Maharashtra implies required net returns of ₹60,000 to ₹75,000 per hectare.

The observed net returns from sugarcane cultivation fall substantially short of this benchmark, resulting in a shortfall of ₹30,000 to ₹45,000 per hectare. Moreover, delays in payment

by sugar factories, often ranging from three to eight months, further reduce effective income by increasing interest burdens and liquidity stress.

Comparative Analysis with Alternative Cropping Systems:

To assess whether sugarcane margins are reasonable in relative terms, returns from sugarcane are compared with major alternative cropping systems commonly adopted in Maharashtra. Net returns over A2+FL are used, as this cost concept best represents income accruing to farm households.

Table 3: Comparative Returns from Sugarcane and Alternative Cropping Systems in Maharashtra (TE2022-23)

Crop / Cropping System	Net Return over A2+FL (₹/ha)	Relative Return (% of Sugarcane)
Sugarcane	91,193	100
Soybean + Gram	43,035	47
Soybean + Wheat	32,496	36
Cotton + Wheat	27,119	30
Paddy + Wheat	-12,918	-14

Source: CACP Calculations using Cost of Cultivation and GVO data, TE 2022-23.

The results indicate that sugarcane provides significantly higher returns than most cereal-based and oilseed-based cropping systems. Even the best-performing alternative system (Soybean + Gram) yields less than half the income from Sugarcane. Paddy-based systems are found to be economically unsustainable under prevailing price and cost conditions.

This relative income advantage explains the persistence of sugarcane cultivation despite

concerns over water use and modest absolute margins.

Sugarcane and High Value Crop Alternatives:

While sugarcane dominates among traditional field crops, its performance relative to selected high-value cash crops presents a contrasting picture. Using net returns over comprehensive cost (C2), the profitability of sugarcane is compared with cotton, soybean, turmeric and banana.

Table 4: Comparative Net Returns from Sugarcane and Selected Cash Crops in Maharashtra

Crop	Gross Returns (₹/ha)	Cost (C2) (₹/ha)	Net Returns (₹/ha)
Sugarcane	1,60,000 – 1,90,000	1,30,000 – 1,55,000	15,000 – 35,000
Cotton	90,000 – 1,20,000	55,000 – 70,000	25,000 – 50,000
Soybean	60,000 – 85,000	40,000 – 55,000	15,000 – 30,000
Turmeric	2,00,000 – 3,00,000	1,20,000 – 1,70,000	60,000 – 1,00,000
Banana	2,50,000 – 3,50,000	1,40,000 – 2,00,000	80,000 – 1,50,000

Source: CACP, DES Maharashtra, NABARD and published studies.

The table shows that several high-value crops generate net returns that are two to four times higher than sugarcane. However, these crops involve higher initial investment, greater price volatility and stronger dependence on market infrastructure. Consequently, sugarcane remains attractive to farmers seeking income stability and assured procurement, even at the cost of lower profitability.

Policy Implications:

The findings of the study suggest several policy implications. First, sugarcane pricing needs to be aligned more closely with the C2 plus 50 per cent benchmark to ensure genuinely remunerative returns. Second, strict enforcement of timely payments by sugar factories is essential to prevent erosion of farm income. Third, policies should actively promote crop diversification towards less water-intensive and higher-value crops through institutional credit, extension services and market support. Finally, improving water-use efficiency through micro-irrigation and rational water pricing is critical for long-term sustainability.

Conclusions:

The analysis shows that Sugarcane cultivation in Maharashtra yields high gross

returns but relatively modest net margins when comprehensive costs and risks are taken into account. The crop persists not because it is highly profitable, but because alternative field crops offer even lower and more uncertain returns. Sustainable improvement in farmer incomes requires a combination of pricing reform, institutional discipline and promotion of economically viable alternatives. Without such measures, sugarcane-based agriculture in Maharashtra may become increasingly unsustainable from both economic and ecological perspectives.

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