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INDUSTRY OUTLOOK

SUGAR INDUSTRY OF INDIA: OUTLOOK AND CHALLENGES

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INTRODUCTION

India has the distinction of being the second-largest global producer of sugar and the second biggest Agro-based sector in the country. Among all states, Uttar Pradesh, Maharashtra, and Karnataka are considered the country's biggest sugar producer. The top nine states in India that are known for their significant sugar production are Maharashtra, Gujarat, Bihar, Andhra Pradesh, Haryana, Karnataka, Punjab, Uttar Pradesh, and Tamil Nadu. Sugar beet plants account for 20 per cent of the total sugar production, and the remaining is derived from the extraction of sugarcane.

Sugarcane plant is the pre-dominant raw material for sugar production in India; the country has among the largest global areas under sugarcane cultivation.



The sector provides direct employment to more than 50 million people including farmers, mill workers and transporters. September to October is known as Sugar Season (SS).¹

Sugarcane

India's sugar industry operates in the organized and unorganized sectors.

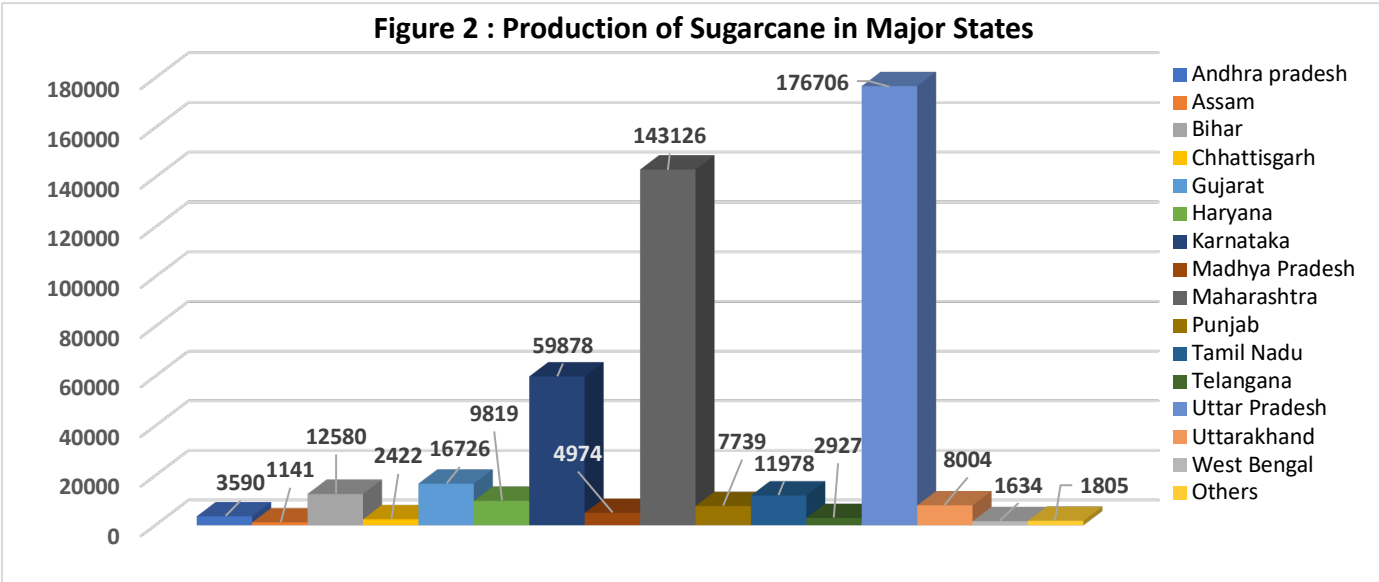
- The organized sector comprises sugar factories that process sugarcane into refined sugar and by products like molasses, bagasse, and press mud.
- The unorganized sector includes traditional produce like gur (jaggery) and Khand sari (semi processed sugar).

The Food and Agriculture Organization (FAO) of the United Nations states that 124 countries produce sugar.² Around 75 per cent of sugarcane produced in India is used by sugar mills to produce sugar and its by-products. However, if alternative sweeteners, such as, Khand sari and Gur are included in the fold, India would be the most significant overall sugar producer. India produces about 35.5 crore tonnes of sugarcane annually in average terms out of which 3 crore tonnes of sugar as the final product. The cost of production of sugarcane for the sugar season 2023-24 is ₹ 157/qtl. This FRPⁱ of ₹ 315/qtl at a recovery rate of 10.25 per cent is higher by 100.6 per cent over the production cost. The FRP for sugar season 2023-24 is 3.28 per cent higher than the last sugar season of 2022-23.

Year	Tamil Nadu	Punjab	Maharashtra	UP	Karnataka	All-India yield	India	FRP (₹)
	Tonnes/ hectare						area	per quintal
2017-18	99.81	83.58	92.00	79.25	84.08	79.66	4737	255
2018-19	103.00	81.82	77.20	80.81	90.00	80.11	5061	275
2019-20	107.62	80.24	84.28	81.31	89.00	80.49	4603	275
2020-21	102.73	83.82	88.90	81.50	95.00	82.20	4857	285
2021-22	109.24	82.15	92.00	82.30	96.00	84.91	5590	290
2022-23	104.78	84.69	91.20	82.31	90.82	84.01	5900	305

Source: E&S, DAC, New Delhi, 3rd Adv. Est.-2022-23

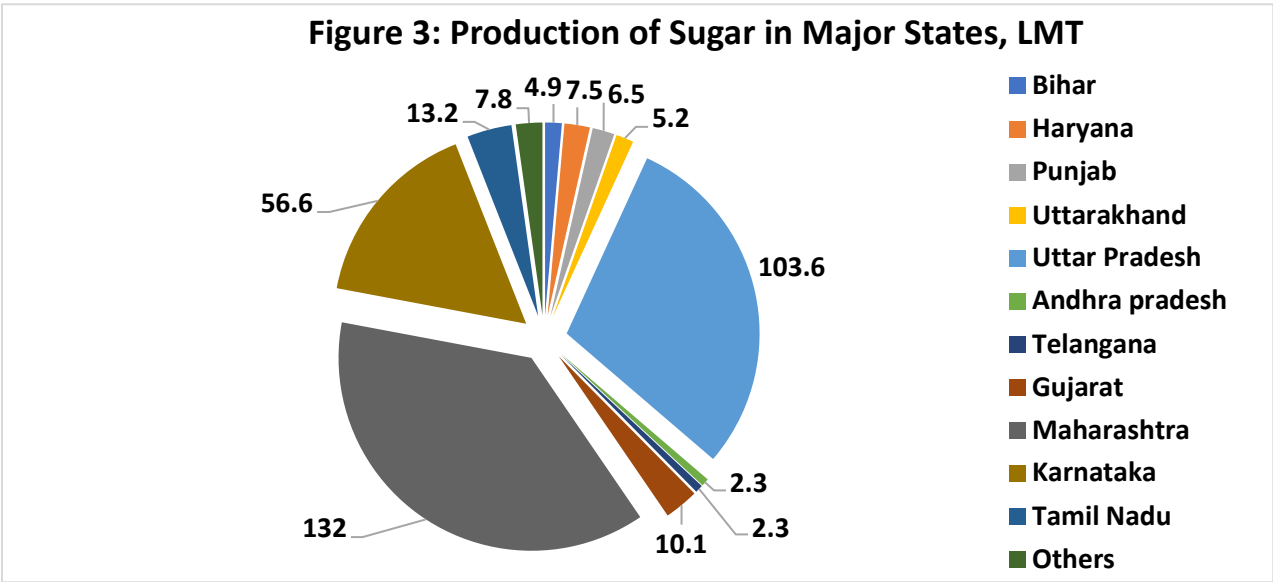
ⁱ The statutory provisions of Sugarcane (Control) Order, 1966 issued under the Essential Commodities Act (ECA), 1955, govern the pricing of sugarcane in India. On 22 October 2009, the Sugarcane (Control) Order, 1966 was amended and the concept of Statutory Minimum Price (SMP) of sugarcane was replaced with the 'Fair and Remunerative Price (FRP)' from 2009-10 sugar season. In order to incentivize higher sugar recoveries, the FRP is linked to a basic recovery rate of sugar, with a premium payable to farmers for higher recovery of sugar from sugarcane.



Source: Price policy for sugarcane, 2022-23, Sugar Season, <https://cacp.dacnet.nic.in/ViewReports.aspx?Input=2&PageId=41&KeyId=820>

Sugar

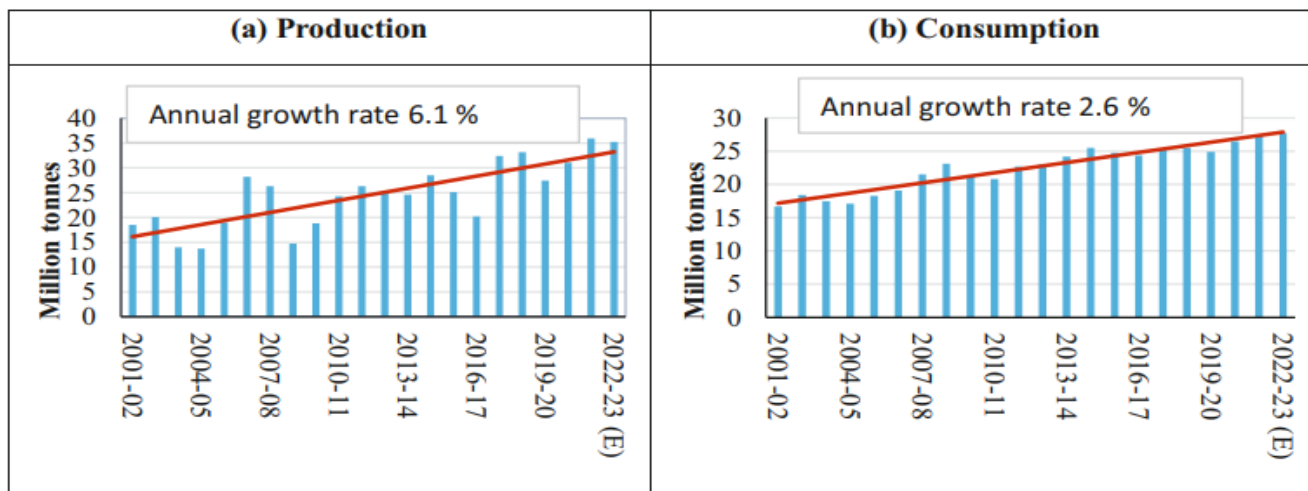
Historically, Uttar Pradesh surpassed Maharashtra in 2016-17 to become the largest producer of sugar in the country. In 2019-20, Uttar Pradesh accounted for 39.6 per cent of the total national production of sugar and the rise in the national share by Uttar Pradesh has been driven by a significant improvement in sugar recovery in the state. In the last two decades, Tamil Nadu’s share in national production of sugar has witnessed a sharp fall. The production of sugar in major producing States in 2022-23 is given in figure below.



Source: Price policy for sugarcane, 2022-23, Sugar Season, <https://cacp.dacnet.nic.in/ViewReports.aspx?Input=2&PageId=41&KeyId=820>

According to the first estimate drawn by Indian Sugar Mills Association (ISMA), Indian sugar yield was pegged at 36.5 million tonnes (MT) during sugar season 2022-23, after considering sugar sacrifice of 4.5 MT, taking the gross sugar production to nearly 41 MT. However, this estimate further reduced to 34 MT of sugar with a sugar sacrifice level at 4.5 MT, owing to the declining yield and recovery from the states of Maharashtra and Karnataka.³ In the current sugar season 2022-23, about 3,353 lakh tons of sugarcane worth ₹ 1,11,366 crore was purchased by the sugar mills. In 2022-23, sugar production was estimated to be marginally lower at 35.2 MT due to an increase in diversion of sugar for ethanol production.⁴

Figure 2: Production and Consumption of Sugar in India 2001-02 to 2022-23



Source: <https://cacp.dacnet.nic.in/ViewReports.aspx?Input=2&PageId=41&KeyId=820>

It was expected that sugar output could fall by 3.3 per cent to 31.7 million metric tons (MMT) in the new season starting from October 1 as low rainfall hit cane yields in the western state of Maharashtra and Karnataka in southern India, which together account for more than half of total Indian output.⁵ Recently, sugar stocks rose because of production worries in the wake of a bad monsoon in the producing regions. The monsoon was harsh for Maharashtra, one of India's top producing states, which saw the driest August in more than a century. In contrast to the 23.5 LMT (Lakh Metric Tonnes) monthly sugar quota that was made available for domestic sale in October 2022, the Food Ministry had allotted sugar mills a 25 LMT monthly sugar quota for September 2023.⁶ Maharashtra accounts for about one-third of the country's sugar production and mills in the state produced 10.5 MT in the 2022-23 season.⁷

The local prices may not rise much as sufficient stocks are available for domestic consumption, which rose only marginally over the past few years. This decline in India's sugar production in the marketing year starting October may cut exports of the commodity by half.

Number of Sugar Factories in India

Table 2: Number of Sugar factories in India					
States	Number of Sugar mills	Number of Operational mills	Installed Production Capacity (Lakh Tonnes)	Capacity Utilization (%)	Recovery Rate (%)
Maharashtra	257.00	200.00	94.65	144.74	11.20
Uttar Pradesh	158.00	120.00	153.24	66.56	11.46
Karnataka	88.00	72.00	63.35	97.24	10.91
Tamil Nadu	46.00	30.00	24.57	49.25	9.26
Andhra Pradesh	33.00	5.00	18.92	10.84	9.38
Gujarat	29.00	15.00	14.53	83.28	10.60
Bihar	28.00	9.00	12.66	36.02	11.39
Punjab	24.00	16.00	12.93	46.09	9.71
Haryana	16.00	14.00	9.38	76.23	9.85
Uttarakhand	10.00	8.00	8.21	55.18	10.38
Others	68.00	33.00	19.07	52.18	-
All India	757.00	522.00	431.51	83.20	11.00

Given that a high sugar recovery rate is directly correlated with the profitability of sugar mills, ongoing endeavors should be directed towards educating and convincing farmers to embrace high-yielding varieties with greater quantities of sugar. Further, capacity utilization should be optimized, and sugar mills should be modernized. Uttar Pradesh exhibited the greatest average sugar recovery rate (11.5 per cent), with Bihar and Maharashtra following suit (11.4 and 11.2 per cent, respectively). Additional states with sugar recovery rates exceeding 10 per cent included Gujarat, Uttarakhand, and Karnataka. Tamil Nadu (9.3 per cent) and Andhra Pradesh (9.4 per cent) exhibited the lowest sugar recovery rates documented.

Ethanol

In an attempt to find an enduring solution to address the problem of excess sugar, the Government is encouraging sugar mills to divert excess sugarcane to ethanol. The Government has fixed a target of 10 per cent blending of fuel grade ethanol with petrol by 2022 and 20 per cent blending by 2025. The target of 10 per cent was achieved successfully during ethanol supply year (ESY) 2021-22. Till 2013, ethanol distillation capacity of molasses-based distilleries was only 215 cr liters. However, in the past 10 years due to the policy changes made by the Government, distillery capacity rose presently to about 347 cr liters. Thus, the overall capacity of ethanol production reached 1070 cr liters. Till 2013, the supply of ethanol to OMCs was only 38 crore liters with blending levels of only 1.53 per cent in ESY 2013-14. The production of fuel grade ethanol and its supply to OMCs increased by more than 11 times from 2013-14 to 2021-22 and historically high figure of 408 cr liters of ethanol was supplied in ESY 2021-22. In ESY 2021-22, a historically high figure of about 433.6 crore liters of ethanol was blended thereby achieving 10.02 per cent blending, which was higher than the set target of 10 per cent for ESY 2021-22.

India is not short of production when looked at from the point of view of consumption because normally we produce 37-40 MT, of which 4-4.5 MT is diverted for ethanol. The nation is left with 32-33 MT, and consumption is estimated at 27.5-28 MT. Ethanol blending with petrol (EBP) had reached 11.76 per cent as of 31 August as against the target of 12 per cent for the entire 2022-23 (December-October) ESY.⁸ For the next sugar season, the diversion of production of sugar for ethanol will depend on the government prices.

Trade

As per the monitoring dashboard of the Ministry of Commerce and Industry, Government of India, the sugar industry exports for FY 2022-23 (April – March) stood at US\$ 5771 million with 25.38 per cent Year-on-Year (YoY) growth and the imports at US\$ 293 million with 73.15 per cent YoY growth registering a positive trade balance of US\$ 5478 million⁹ (see table below).

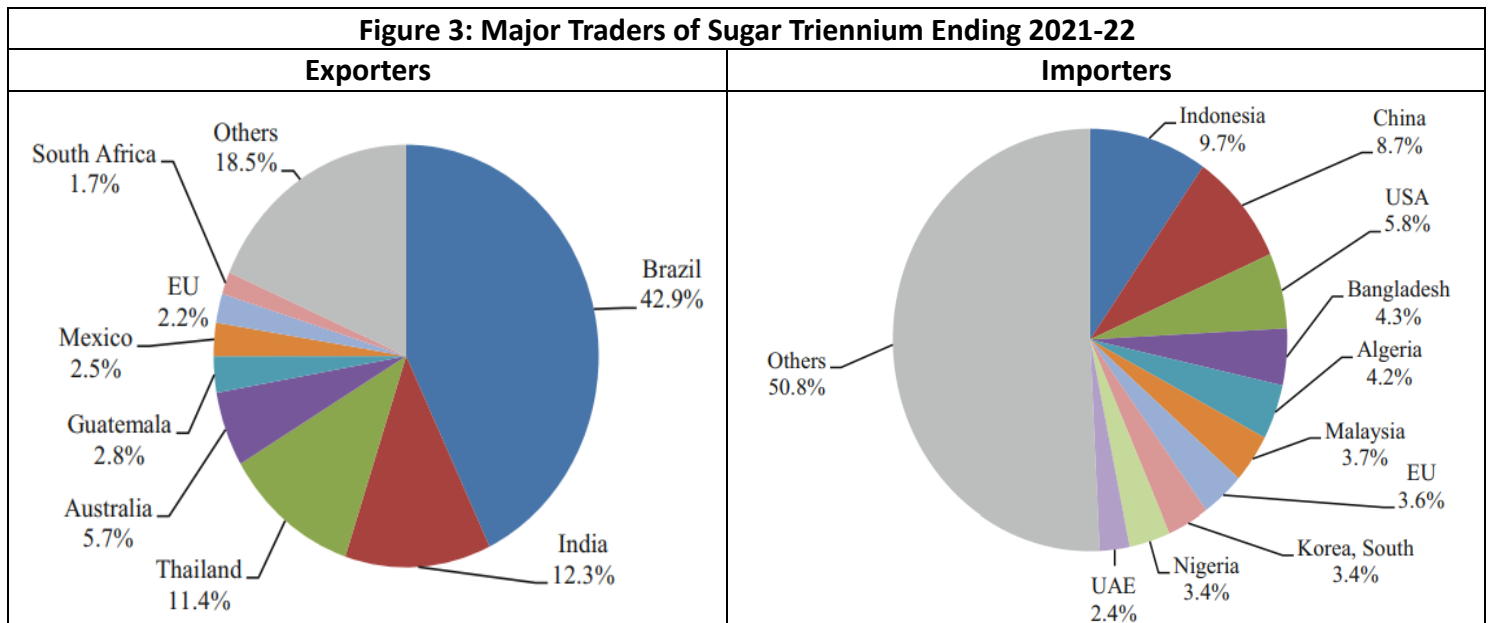
Table 3: Growth in Sugar Exports (US\$ Million)					
Financial Year	Month/Year	Current Year: Value	Previous Year: Value	Monthly YoY Growth	Cumulative YoY Growth
2022-23	April	680	489	39.00 %	39.00 %
	May	709	341	107.83 %	67.26 %
	June	500	297	68.21 %	67.51 %
	July	255	210	21.60 %	60.31 %
	August	268	228	17.32 %	54.04 %
	September	225	255	-11.85 %	44.79 %
	October	237	208	13.58 %	41.59 %
	November	339	240	41.08 %	41.54 %
	December	782	512	52.79 %	43.61 %
	January	697	789	-11.77 %	31.36 %
	February	590	579	1.93 %	27.26 %
	March	491	454	8.20 %	25.38 %
2023-24	April	331	680	-51.35 %	-51.35 %
	May	246	709	-65.35 %	-58.49 %
	June	135	500	-72.97 %	-62.32 %
	July	162	255	-36.36 %	-59.23 %

Source: <https://dashboard.commerce.gov.in/commercedashboard.aspx>

Table 4: Growth in Sugar Imports (US\$ Million)					
Financial Year	Month/Year	Current Year: Value	Previous Year: Value	Monthly YoY Growth	Cumulative YoY Growth
2022-23	April	1	85	-98.40 %	-98.40 %
	May	1	11	-90.51 %	-97.47 %
	June	1	2	-13.48 %	-96.13 %
	July	1	1	-53.02 %	-95.58 %
	August	41	2	2069.20 %	-55.01 %
	September	92	23	297.09 %	10.76 %
	October	37	3	1387.34 %	38.18 %
	November	1	2	-47.77 %	36.51 %
	December	38	2	1525.45 %	63.15 %
	January	39	1	4710.23 %	91.72 %
	February	1	1	-28.36 %	90.80 %
	March	39	36	8.31 %	73.15 %
2023-24	April	1	1	-48.02 %	-48.02 %
	May	121	1	11177.30 %	4919.41 %
	June	107	1	7833.93 %	5962.43 %
	July	180	1	30425.85 %	9261.39 %

Source: <https://dashboard.commerce.gov.in/commercedashboard.aspx>

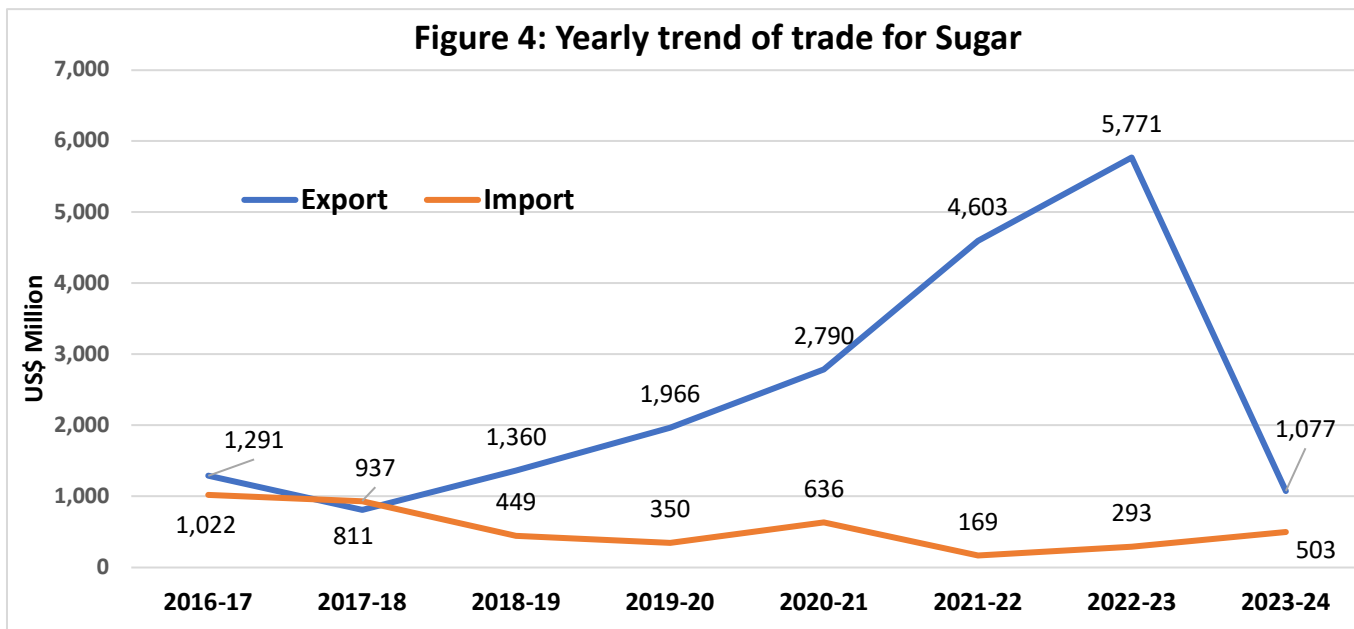
As per the monitoring dashboard of the Ministry of Commerce and Industry, the Government of India, the sugar industry exports for FY 2023-24 (April – July) stood at US\$ 874 million with -59.23 per cent Year-on-Year (YoY) growth and the imports at US\$ 409 million with 9261.39 per cent YoY growth registering a positive trade balance of US\$ 465 million¹⁰ (see table-----).



Sources: Commission for Agricultural Costs and Prices (CACP 2023-24), Department of Agricultural Cooperation and Farmers Welfare, Ministry of Agricultural and Farmers Welfare. Available at <https://cacp.dacnet.nic.in/KeyBullets.aspx?pid=41>

Additionally, it is important to be aware of the leading exporting and importing countries that determine the supply and demand in the global market. An illustration of the same is presented in the figure above. Brazil contributes over one-third of the global sugar export market. In terms of total exports, India, the second largest producer, comes third, trailing Thailand. Indonesia, China, and the United States collectively account for over one-fifth of the total sugar imported and are among the largest importers of sugar.

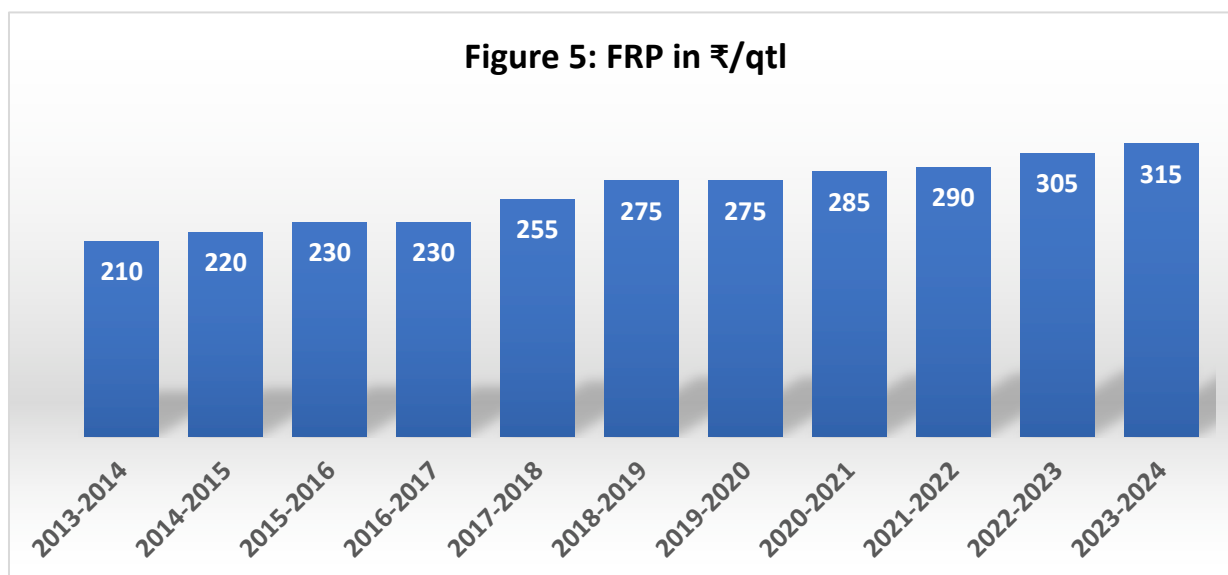
India has been exporting surplus sugar for the last five years (see figure below). However, after curbs in the previous season, the Government could ban sugar exports this season as well as to curb the surge in domestic prices. As per DAM capital, global sugar prices are currently higher at ₹ 47 a kg and ₹ 59 a kg, resp., compared to the current domestic prices of ₹ 38 a kg. With sustainable sugar production in UP, higher sugar prices and increasing utilization of new distillery capacity, UP-based sugar companies are expected to witness strong earnings growth during the next two years.¹¹



Government Initiatives

Fair and Remunerative Price (FRP)

The Central Government fixed a Fair and Remunerative Price (FRP) of sugarcane, considering the factors mentioned in Clause 3(1) of the sugarcane (Control) order, 1966. Keeping in view interest of sugarcane farmers (Ganna-Kisan), the Cabinet Committee on Economic Affairs chaired by the Prime Minister Shri Narendra Modi has approved FRP of sugarcane for sugar season 2023-24 (October- September) at ₹ 315/qtl for a basic recovery rate of 10.2 per cent, with more than 100 per cent margin over paid-out cost + imputed value of family labour (A2+FL cost). It has also been approved to provide a premium of ₹ 3.07/qtl for each 0.1 per cent increase in recovery over and above 10.25 per cent, and reduction in FRP by ₹ 3.07/qtl for every 0.1 per cent decrease in recovery.¹²



Source: <https://pib.gov.in/PressReleaselframePage.aspx?PRID=1935899>

Ethanol Prices

The Ministry of Petroleum and Natural Gas has increased procurement prices for ethanol derived from sugarcane derivatives under the EBP program for ESY 2022/23 (December-November).¹³

Feedstock	ESY 2021/22	ESY 2022/23
Sugarcane Juice/Sugar Syrup/Sugar	63.45	65.61
B-Heavy Molasses	59.08	60.73
C-Heavy Molasses	46.66	49.41
Damaged Food Grains/Maize	51.55	55.54
Surplus Rice (from Food Corporation of India)	56.87	58.50

Source: MoPNG.

Budget Allocation for Sugar

Allocation	2021/2022	2022/2023		2023/2024	% change
	Realized Outlays	Initial Budget	Revised Budget	Budget	
Scheme for creation and maintenance of buffer sugar stocks	96.04	0	3	0	(100)
Scheme for extending financial assistance to sugar mills for enhancement and augmentation of ethanol production capacity	160	300	259.8	400	54
Scheme for aiding sugar mills for expenses on marketing costs including handling, upgrading and other processing costs, etc.	3477.6	0	20.5	0	(100)
Schemes for development of sugar industries	143.1	84.81	77.7	10	87.2
Scheme for assistance to sugar mills for 2018- 19 season	122.18	0	1.5	0	(100)
Scheme for assistance to sugar mills for 2019- 20 season	2120.9	0	14.5	0	(100)
Scheme for defraying expenditure towards internal transport, freight, handling, and other export fees	3.1	0	20.5	0	(100)

Source: Department of Food and Public Distribution.

Note: Per cent change depicted for 2023/2024 with initial budget estimate over 2022/2023 revised budget estimate. One crore equals ten million.

Centre tightens the reins for the sugar traders.

May it be sugar traders, wholesalers or processors, the Government is putting in export curbs for the past two years and in September 2023, it tamed the domestic prices again, the reason being the dry monsoon in the month of August 2023. Hence, the production seemed lower than expected. The Government has asked the traders to send in a detailed report on the Government mandated portal. Global sugar players are monitoring India's production in 2023-24. An early quota of 1.3 MT was released for October. These restrictions are extended even further, as the world's second largest producer tried to bring down domestic prices by increasing supplies. These restrictions will affect the benchmarks in New York and London, where the prices are already extremely high, triggering global inflation in food prices. For market year 2023-2024, post estimates India's sugar exports are expected to reach 7 MMT, accounting for high domestic demand and the likelihood that the Indian Government maintains export caps to control inflation. To manage trade, the Ministry of Commerce and Industry has retained sugar under its restricted category for MY 2022-2023.ⁱⁱ

Due to the expectation that El Nino would persist through 2023–24, which could intensify dry conditions during the following sugar season, sugar output is predicted to fall to 30 MT in the 2023–24 sugar season, compared to the domestic demand of 27.5–28 mt. This could cause sugar production to drop even further in the 2024–2025 season.

Globally, sugar production is in deficit for the sugar season 2023-24. This is majorly because Thailand has been hit by its worst drought season. Brazil is still in the same boat with its production in doubt due to its Biofuel policy.

National Biofuel Policy and Ethanol Blended Petrol Program

The Indian Government set targets for the national average ethanol blend rates in gasoline of 10 per cent (E-10) and 20 per cent (E-20) by 2022 and 2025, respectively, under the National Biofuel Policy 2018. The program's objective is to boost the production of ethanol from sugarcane, broken grains, and other feedstock. To achieve this target, the Indian Government is encouraging sugar mills and distilleries to divert surplus sugar derivatives to produce ethanol under the EBP. India achieved its E-10 target, briefly reaching a national blending average of 10.1 per cent in June 2022, and additional projects are in place to reach E-20.¹⁴

Antyodaya Anna Yojana program

The Indian Government has reviewed the existing sugar under Sugar Subsidy Scheme for distribution of sugar through Antyodaya Anna Yojana program (uplifting the poorest food plan) at ₹ 18.50/kg (US\$ 0.24/kg), providing a kilo of sugar per family per month. Further, states and union territories are permitted to add on any extra expenses related to shipping and handling fees directly to the beneficiary to incur directly to the retail issue price of ₹ 13.50/kg (US\$ 0.16/kg).¹⁵

Cane Arrears

Minimum Selling Price (MSP) of sugar was fixed to prevent fall in ex-mill prices of sugar & accumulation of cane arrears (initially at ₹ 29/ kg w.e.f 07-06-2018; revised to ₹ 31/kg w.e.f. 14-02-2019).¹⁶ According to the Department of Food and Public Distribution, India's cumulative arrears (debt) as of March 15, 2023, stood at US\$ 2.1 billion (₹ 171.1 billion), 190 per cent higher than the debt burden of US\$ 726.3 million (₹ 59.1 billion), observed on September 30, 2022.¹⁷ Cane arrears differ by state, the number of functional mills, and the average sugar recovery rate. As of February 2023, Uttar Pradesh cane arrears stood at US\$ 1.2 billion (₹ 91.5 billion), a figure which included outstanding debts from the previous market year.¹⁸

ⁱⁱ With sugar under the "restricted" category, exports are only granted through permission from the Ministry of Consumer Affairs.

Financial assistance of more than ₹ 18,000 crore extended to mills resulting in clearance of farmers' dues for 7 years i.e., sugar season 2014-15 to 2020-21. The diversion of surplus sugar to ethanol production led to improved financial conditions of sugar mills. As a result, they can clear cane dues early. As a result of these measures, about 99.9 per cent of cane dues up to sugar seasons 2020-21 have been cleared. For the previous sugar season 2021-22, more than 99.9 per cent cane dues were cleared and in the current Sugar Season 2022-23, about 91.6 per cent cane dues were cleared as on 17.07.2023.¹⁹

The government policies and regulations have a significant impact on the Indian sugar industry. The government's policies related to sugarcane pricing, subsidies, and export incentives can shape the industry's future. Any changes in these policies can greatly influence the profitability and competitiveness of the sector.

Industry Risk

The Indian sugar industry has had unprecedented success in the past few years due to a multitude of factors. While favorable agricultural output was aided by the weather, the initiative to mix ethanol with gasoline gained significant traction. The long-standing issue of rapidly increasing sugarcane arrears nearly vanished, as exports surged to all-time highs. Despite these welcome developments, the industry continues to face some headwinds.

Pricing Issues

One of the most significant issues in the Indian sugar industry is the pricing of sugarcane, which is the primary raw material for sugar production. Sugar prices in India are cyclical, influenced by factors, such as, production levels, international sugar prices, and government policies. Prices can fluctuate significantly, affecting the profitability of sugar mills. The Government sets a State Advised Price (SAP) for sugarcane, which can sometimes be higher than what the sugar mills can afford to pay. This leads to financial stress for the mills. In addition to SAP, the Government also sets a Fair and Remunerative Price (FRP) for sugarcane. The FRP is generally higher than the SAP and is intended to provide a fair return to sugarcane farmers. However, it can aggravate the financial pressure on sugar mills as the Government sets a FRP for sugarcane, it often leads to conflicts between sugarcane farmers and sugar mills. Farmers argue for higher prices, while mills may find it difficult to pay these prices consistently. The Indian sugar industry is also influenced by international sugar prices. A surplus or deficit in the global market can impact Indian sugar prices and exports.

The Government had fixed MSP of sugar at ₹ 31 per kg in February 2019 and it had remained unchanged since then. However, the FRP of sugarcane had increased from ₹ 2550 per tonne in 2017-18 to ₹ 3050 per tonne for the year 2022-23.²⁰ ISMA had already urged the Government to increase the MSP of sugar to ₹ 38 per kg from ₹ 31 per kg in line with FRP of cane.

Water Scarcity

Sugarcane is a water-intensive crop, and water scarcity is a significant concern in many parts of India. Excessive water use in sugarcane cultivation can strain local water resources. India's excess sugar production is guzzling groundwater. Normally, 100 kg of sugar is produced from one tonne of sugarcane, which consumes around 2 lakh liters of groundwater for irrigation alone. This issue assumes greater importance because the UNESCO United Nations World Water Development Report ²¹ of 2023 highlighted global concern over the sharp rise in freshwater withdrawal from streams, lakes, aquifers and human-made reservoirs, impending water stress and also water scarcity. This Report stressed "safeguarding water, food and energy security through sustainable water management, providing water supply and sanitation services to all, supporting human health and livelihoods,

mitigating the impacts of climate change and extreme events, and sustaining and restoring ecosystems and the valuable services they provide, are all pieces of a great and complex puzzle. Only through partnerships and cooperation can the pieces come together. And everyone has a role to play. Sustainable Development Goal 6 (SDG 6) is to ensure availability and sustainable management of water and sanitation for all by 2030.

At current rates, progress towards all the targets of SDG 6 is off-track and in some areas the rate of implementation needs to quadruple, or more. The inadequate rate of progress on water and sanitation highlights the need to explore opportunities through partnerships and cooperation". Similarly, the Food and Agriculture Organization of the United Nations (FAO)'s Water Report²² cogently argued for "guidance on realizing real water savings with crop water productivity interventions", that includes clear and practical guidelines on how to implement 'real' water savings in agriculture through interventions for enhancing crop water productivity".

Given the evolving macro-economic scenario of high-water stress, drought risk, acute water shortages, sectoral and regional competition, and rural-urban transfer of water, some important policy prescriptive suggestions by Gulati, et al ²³, are as follows:

- Implement price policies that reflect the scarcity and economic value of water and power use in agriculture, while improving the quality and timely availability of these to farmers.
- Strengthen marketing opportunity of sugarcane and procurement policies of rice in the water abundant states of eastern region. At the same time, set the markets right (reduce market risk) for the less water intensive crops that give much higher value per cubic meter of irrigation water applied in water scarce states.
- Direct Benefit transfer of water and power subsidies to farmers.
- If price reforms with DBT of water and power subsidies are not possible, ration irrigation water and power used in agriculture on per hectare basis, and then let the water markets operate amongst farmers.
- Adopt irrigation technologies and practices that encourage water savings, such as micro irrigation system in sugarcane and rice.

Ethanol Blending Mandates

While the Indian Government has encouraged EBP to reduce the country's dependence on fossil fuels, this shift can create competition for sugarcane between the sugar and ethanol industries.

Way Forward

Sustainability and environmental concerns are becoming increasingly important globally. In the medium-term, the Indian sugar industry has to focus on sustainable farming practices, waste management, and reducing water usage to meet the demands of environmentally conscious consumers and international markets. The industry's future is inextricably linked to sugarcane farming. Challenges such as water scarcity, climate change, and diseases affecting sugarcane crops can severely dent the industry's growth and productivity. Farmers and sugar mills, therefore, need to find innovative solutions to address these challenges with a sense of urgency.

As consumer preferences shift towards healthier food choices, there may be a growing demand for alternatives to traditional sugar. The Indian sugar industry needs to adapt by exploring low-calorie sweeteners or producing healthier sugar variants for steady growth over the long haul.

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