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GROWTH AND DEVELOPMENT OF INDIAN SUGAR INDUSTRY

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ABSTRACT
This paper presents growth and development of Indian sugar industry during the study period of 2014-15 to 2023-24. India is the second largest producer and consumer of sugar in the world. Also, the usage of the sugar is increasing 2.2% annually in India. India is the first country to produce the sugar.in recent time, with 31 million metric tons of total sugar intake, India ranked second in the year 2023-24. From all India production of sugar has increased during this ten year of study period. Compound annual growth rate of sugar production is 1% of ten-year study period. Sugarcane acreage has also increased to 5944(000 hectares) in the year 2023-24. Although the numbers of factories in operation got decreased to 533 in the year 2023-34. Conclusion of the study would be Indian Sugar Industry is growing and developing phase and also in a race to be ranked first globally.

Key Words: India, sugar Industry, CAGR, Production

1. INTRODUCTION:

With cycles of production and consumption, sugar is an important sector of the national economy. In 2022-2023, India, the second-largest producer and consumer in the world, will be responsible for 15.5% of worldwide consumption. The size of the worldwide industrial sugar market was USD 39.59 billion in 2023 and is projected to grow at a compound annual growth rate (CAGR) of 3.23% to reach USD 40.63 billion in 2024 and USD 50.76 billion by 2032. Even though it is considered a heritage industry, conventional farming methods are being used, and new innovations have gone overlooked. Nonetheless, business and government have worked together to record sugar exports and develop a successful ethanol fuel blending scheme. By 2032, the size of the worldwide industrial sugar market is anticipated to reach USD 50.76 billion.
India's use of sugar is increasing by 2.2% annually. It is over one percent stronger than the global average. In addition to its significant socioeconomic significance for the nation, the sugar sector also contributes to the rural economy. Because bagasse is used extensively to generate steam and power, the sugar industry is environmentally friendly and almost self-sufficient in its energy needs. (Wright, n.d.)

2. HISTORY OF SUGAR AND SUGARCANE

Originating from the Sanskrit word "śarkarā," which means "ground or candied sugar," sugar was initially made from sugarcane plants in northern India in the first century CE. Originating in New Guinea, the word "sugar" was then traced back to South Asia and India. The first country to produce sugar was India, which used pressure to extract the juice from sugarcane and then boiled it to form crystals. In order to obtain its sweetness, sugar was first chewed uncooked. About 350 AD, the Gupta dynasty figured out how to crystallize sugar.
With an average production of 70 tons per hectare, it currently has over 4 million hectares of land planted to sugarcane. With 26 million tonnes of raw value, India is the world's largest producer of traditional cane sugar sweeteners including Khandsari and gur. Gur and Khandsari were among the alternative sweeteners that consumed about two-thirds of the sugarcane produced in the early 1930s. The demand for sweeteners has changed to white sugar as a result of rising earnings and improved living standards. The Gur and Khandsari sectors currently use one-third of the sugarcane produced.
With tariff protection, India's sugar processing sector got underway in 1930, which boosted the number of sugar mills and output. With an emphasis on goals for sugar production, consumption, licensed and installed capacity, and

sugarcane production, the government started planning for industrial development in 1950–51. The industry requested policy guidance on Khandsari plant placement, new industrial location, and licensing. Supporting industry growth was the goal of the 1951 Industries Act, which was revised in 1956. In order to support the growth of the sugar sector, especially in the tropical region, the government also implemented a new licensing regime in 1954. The goal of the government's industrial development programs was to ensure the success of the sector and encourage its growth. The government's ambitions for the sugar sector were set to take off. (Chini Mandi, n.d.)

INDIAN SUGAR INDUSTRY AT PRESENT:

After cotton, India's sugarcane and sugar industry comes in second place among agro-based industries. India is the world's top producer of sugar. In 2023–2024, it generated roughly 34 million metric tons of sugar. In addition to providing for the livelihood of rural sugarcane farmers, it also employs around half a million people in sugar mills. Furthermore, the sugar harvest generated around 806 billion Indian rupees in gross value added. India was the world's third-largest sugar exporter in addition to being the world's top producer.

In 2023–2024, 34 million metric tons of sugar is anticipated to be produced in India, with Uttar Pradesh leading the way. The main source of sugar is sugarcane crops, which are crushed, their juice extracted, cooked, and then crystallized before any remaining juice or syrup is removed by centrifugation. The crop is crushed, the juice is extracted, the crop is boiled, and the sugar crystals are crystallized. The production of sugar in India is handled by about a thousand producers.

With rising consumption of ice cream, baked goods, confections, mithai, and processed food and drink items, India is a country that consumes a lot of sugar. With 31 million metric tons of total sugar intake in 2023–2024, India ranked second globally in terms of the number of diabetes. This has contributed to the nation's sugar consumption and helped revive consumer product demand. (Statista, n.d.)

3. LITERATURE REVIEW:

(A.K. Sgrivastva, 2011)Since ancient times, sugarcane has been a major crop in India; it has been mentioned in ancient writings and described in books by many monarchs and explorers. In 1610, Captain Hippon founded the first sugar factory in India at Masulipatam and Petapoli on the Coromandel Coast. Captains Best and Dowton followed suit in Surat. Many farmers cultivate sugarcane, and several Acts and Sugarcane Control orders govern its supply, sale, and payment. Development of sugarcane is essential at the state and federal levels. India now holds a distinguished position among sugar-producing countries, ranking second only to Brazil, thanks to its quick development in sugarcane farming and manufacturing. The socioeconomic development of rural areas has been significantly influenced by the sugar business.

(Ray, 2012)This study aims to assess the economic performance of the Indian sugar sector using aggregate capacity utilization data collected econometrically between 1979–1980 and 2008–2009. The lowest point on the company's short-term average total cost curve is considered optimal output in this study, and the rate of capacity utilization is simply the ratio of actual output to capacity output level. The findings imply that there was a notable fluctuation in the capacity utilization rates across years within the same industry, according to the choice theoretical framework. During the post-reform era, this industry's capacity utilization growth rate has decreased. Liberalization has been observed to have a major detrimental effect on the Indian sugar industry's use of its economic capacity.

(Mane, 2016)India has more than 500 sugar manufacturing facilities that engage in everything from sugarcane cultivation to processing, making it a major employer. The majority of these units have chosen cogeneration in the last 20 years, which has greatly boosted their installed capacity. These facilities are now integrated complexes that produce ethyl alcohol, generate electricity, and supply the grid. Ten of the 37 sugar mills in the Belgaum district of Karnataka have an installed capacity of 993 MW. Better performance is the result of the private sector managing the majority of these units. By examining the causes of these variations, the study hopes to improve knowledge of the cane sector. The sector generates 5000 MW of eco-friendly and renewable power, requiring proper attention. The study includes 45 research papers and interactions with officials of five sugar units in Belgaum. The findings can inform policy implications, as sustainable development necessitates new strategies and solutions.

(Sandeep Singh, 2021)The Indian sugar business is currently experiencing a lot of upheaval. Major stakeholders' incentives are not aligned, which is causing the industry to decline rapidly. Studying the current state of affairs, its dynamics, and potential future trends under various conditions becomes crucial as a result. In order to study the dynamics of sustainability of the sugar sector in Uttar Pradesh India, we have developed the interaction between various variables and parameters using the systems dynamic approach. According to our research, the sugar industry

has to enhance resource efficiency, operational costs, supply chain coordination, and information flow transparency in order to attain sustainable development. Our investigation has led to the proposal of operational and policy-level recommendations aimed at assisting the industry in attaining sustainable development and enhancing performance.

4. OBJECTIVE OF THE STUDY

Evaluating the growth and development of India's sugar industry from the year 2014-2015 to 2023-2024 is the main objective of this study.

5. METHODOLOGY OF THE STUDY:

The study is based on secondary data, wherever secondary data was required for this study, it was acquired; industry publications, books, journals, and the internet were among the primary sources.

6. TIME PERIOD OF THE STUDY:

It is a chronological analysis that includes the years 2014-15 to 2023-24.

1.1 Stat wise Sugar Production in India: (000 tonnes)

State	2014 -15	2015 -16	2016 -17	2017 -18	2018 -19	2019 -20	2020 -21	2021 -22	2022 -23	2023 -24	CAGR (%)
Andhra Pradesh	564	551	385	466	508	285	199	210	188	157	-13%
Bihar	526	503	526	716	841	728	475	457	627	689	3%
Gujarat	1153	1168	885	1105	1123	932	1047	1208	998	928	-2%
Haryana	576	539	668	844	702	743	761	715	748	608	1%
Karnataka	4935	4049	2165	3754	4430	3494	4467	6038	5657	5189	1%
Kerala & Goa	11	10	4	6	4	0	0	0	0	0	-100%
Madhya Pradesh	450	398	406	550	563	460	536	653	596	680	5%
Maharashtra	10506	8424	4203	10723	10720	6169	10650	13720	10590	11096	1%
Punjab	537	671	692	824	787	538	547	596	657	593	1%
Rajasthan	6	5	10	7	11	9	9	7	8	12	8%
Telangana	322	278	116	269	257	139	123	228	263	184	-6%
Tamil Nadu	1256	1367	1067	712	955	788	878	1247	1482	1073	-2%
Uttar Pradesh	7101	6840	8773	12048	11821	12638	11059	10199	10484	10414	4%
Uttrakhand	325	273	346	419	401	458	416	453	491	311	0%
Others	48	49	39	36	39	30	25	29	26	29	-5%
All India	28310	25125	20285	32479	33162	27411	31192	35760	32815	31964	1%

(Source: www.chinimandi.com)

Analysis: Above table 1.1 shows the state wise sugar production in India from the year 2014-15 to 2023-24. There is an increasing trend in production of sugar starting with the year 2014-15 production of sugar were 28310 thousand tonnes to in the last year 2024-25 production were 31964 thousand tonnes during the study period. **CAGR (Compound Annual Growth Rate)** Growth rate of all India during the 10-year study period is only 1%. Maximum CAGR growth rate is 8% of Rajasthan, then followed by Madhya Pradesh 5%, Uttar Pradesh 4% and Bihar has 3% during the ten years of study period. Haryana, Karnataka, Maharashtra and Punjab have 1% growth rate. With -100% CAGR Kerala and Goa has the least growth rate during the study period. While other states have declining rate during the study period, Uttarakhand (0%), Tamil Nadu (-2%), Gujarat (-2%), Telangana (-6%), Andhra Pradesh (-13%) and others have (-5%).

1.2 State wise number of factories in operation:

State	2014 -15	2015 -16	2016 -17	2017 -18	2018 -19	2019 -20	2020 -21	2021 -22	2022 -23	2023 -24
Andhra Pradesh	22	19	18	18	18	12	8	5	5	5
Bihar	11	11	11	11	11	11	9	9	9	9
Gujarat	20	21	20	17	16	15	15	15	16	17
Haryana	14	14	14	14	14	14	14	14	14	14
Kerala & Goa	65	64	64	66	67	63	66	73	75	76
Madhya Pradesh	19	2	21	22	23	24	24	24	23	22
Maharashtra	183	180	152	187	195	143	190	200	210	207
Punjab	16	16	16	16	16	16	16	16	16	15
Rajasthan	1	1	1	1	1	1	1	1	1	1
Telangana	10	7	7	7	7	7	6	7	7	6
Tamil Nadu	45	43	40	36	35	27	28	30	30	30
Uttar Pradesh	118	117	116	119	119	119	120	120	118	121
Uttarakhand	9	8	8	7	7	7	7	8	8	8
Others	4	4	4	3	2	2	2	2	2	2
All India	538	526	493	525	532	461	506	524	534	533

(Source: www.chinimandi.com)

Analysis: Above table 1.2 shows the state wise number of factories in the operation in India during the study period from 2014-15 to 2023-24. There was total 538 factories in the year 2014-15 and in the last year number of factories were 533, so there is a decrement in factories during the study period. There is increase in number of factories in following states, Kerala & Goa from 65 to 76, Madhya Pradesh from 19 to 22, Maharashtra from 183 to 207 and Uttar Pradesh from 118 to 121 during the study period. While in Andhra Pradesh, Gujarat, Bihar, Punjab, Telangana, Tamil Nadu and Uttarakhand number of factories got decreased during the study period.

1.3 State wise Sugarcane Acreage in India: (000 Hectares)

State	2014 -15	2015 -16	2016 -17	2017 -18	2018 -19	2019 -20	2020 -21	2021 -22	2022 -23	2023 -24
Andhra Pradesh & Telangana	210	190	186	177	188	150	149	150	157	150
Bihar	302	280	296	300	305	274	257	241	252	259
Gujarat	158	185	180	182	187	187	201	210	224	222
Haryana	115	116	120	122	117	115	114	112	125	110
Karnataka	499	510	410	415	502	420	501	585	650	675
Madhya Pradesh	131	155	150	140	135	425	143	144	147	146
Maharashtra	1060	1050	765	915	1154	776	1148	1350	1450	1498
Orissa	30	30	43	35	35	40	38	39	41	41
Punjab	98	100	105	105	93	90	85	84	90	90
Tamil Nadu	255	250	260	201	260	230	240	260	285	248
Uttar Pradesh	2307	2302	2310	2330	2411	2321	2307	2308	2386	2415
Uttarakhand	115	116	120	120	115	112	105	100	100	9
Total	5307	5284	4945	5042	5502	4841	5288	5583	5407	5944

(Source: www.chinimandi.com)

Analysis: Above table 1.3 shows the State wise Sugarcane Acreage in India during the study period from 2014-15 to 2023-24. Total area of sugarcane has been increased during the study period. In the year 2014-15 area of sugarcane acreage were 5307 thousand hectares it got increased to 5944 thousand hectares in the year 2023-24. In Andhra Pradesh and Telangana sugarcane acreage reduced from 210 to 150 thousand hectares, while in Gujarat it increased from 158 to 222 thousand hectares. In Bihar it got decreased to 259 thousand hectares. Also, in Haryana it reduced.

In Maharashtra acreage of sugar were 1060 thousand hectares in 2014-15 and in 2023-24 it increased to 1498 thousand hectares. Overall, there is increasing trend in sugarcane Acreage in India during the study period.

CONCLUSION

Conclusion of the study would be despite of increasing in the acreage of sugarcane there is a reduction in numbers of factories in India. Although there is a 1% compound growth rate in total production of sugar during the study period. From being the second largest producer of sugar to be the first largest producer, Indian sugar industry new scientific breakthroughs, technical interventions, and automation make it feasible.

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