Performance of Agro based Industries in India with Special Reference to Sugar Industry - An Assessement

G. Shivagami
Research Scholar & Professor, Department of Economics
Bangalore University, Bangalore, Karnataka, India

T. Rajendra Prasad
Professor, Department of Economics
Bangalore University, Bangalore, Karnataka, India

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Abstract
The Indian sugar industry is a key driver of rural development, supporting India's economic growth. The industry is inherently inclusive, supporting over 50 million farmers and their families, along with workers and entrepreneurs of almost 550 sugar mills, apart from a host of wholesalers and distributors spread across the country. The Indian sugar industry is cyclical as, on the one hand it serves the domestic market, the largest in the world. Sugar is a sector of significant importance to the national economy. It has done so by commercially utilizing the rural resources to meet the great domestic demand for sugar and by generating surplus energy to meet the increasing energy needs of India. In addition to this, the industry has become the mainstay of the alcohol industry. The sugar sector also has a significant standing in the global sugar space. The Indian domestic sugar market is one of the largest markets in the world in terms of volume. India is also the Second largest sugar-producing nation and remains a key growth driver for world Sugar growing above the Asian and world consumption growth average.

Keywords: Sugar, Khandhasari, Ethanol, Co-gen, Gur, Molasses, Spirit, Industry, Cane cultivation.

Introduction

The sugar industry in India plays a vital role in socio economic development in rural areas by mobilizing rural resources and generating higher income and employment opportunities. About 7.5 percent of the rural population covering about 45 million sugarcane farmers, their dependents, and a large number of agricultural laborers are involved in sugarcane cultivation, harvesting, and ancillary activities. About half a million skilled and semi-skilled workers, From the rural areas are also engaged in the sugar industry. In India, the sugar industry is the second largest agro-based industry, next only to textiles and contributes about Rs.1650 crore to the central exchequer as excise duty and taxes annually. Besides, the State Governments realize about Rs.600 crore annually through purchase taxes, cess, etc. The total value of sugarcane produced in the country is estimated at Rs.24000 crore per year. Sugar exported from India increased from 2000 tonnes [valued at Rs.0.91 crore) in the financial year 1990-91 to 1004317 tonnes [valued at Rs.2119.68 crore], in the financial year 2006-07 [upto July 2006],

The sugar industry in India finds itself entangled in a complex web of problems leading to declining profitability to the cane growers as well as the sugar industry. The reasons for the same are to be traced and suitably addressed to give a boost to this sector in the country.

Unlike many western or major sugarcane growing countries, sugarcane is the only source of sugar in our country, and therefore, any mismatch between demand and supply of sugar in the country assumes significance at the national level and influences the economics of sugarcane cultivation to a great extent. The initiatives by the State Governments in the form of fixing a remunerative sugarcane price and pressurizing sugar mills to make payment within a reasonable time encouraged farmers to put in more area under the sugarcane crop. This underlines the need to study the economics of sugarcane cultivation to understand the effectiveness of the price policy in determining the area under sugarcane crop. The initiatives of research institutions, particularly those directly involved with sugarcane crop, are required to be listed to study the growth in productivity of sugarcane crop. Further, the globalization of the Indian economy started in the early 90s is bound to direct the trade of agricultural commodities in the years to come.

Review of Literature

In this section, an attempt has been made to review past studies related to Sugar industries in India and Karnataka. The review of the following studies would help us to understand the growing trend of the Industry, problems encountered by the Industry Income, Employment, Export, Price level, crushing capacity, and sugar co-operatives of the working units in the Indian economy. The following are some of the important studies reviewed here are as follows;

Mahalingam (1980) has indicated that co-operative sugar factories are one of the important co-operative processing industries in India. It brings in a lot of benefits to the farmers who supply the cane to the factory on a remunerative price. He thinks that co-operative should make a positive contribution by supplying various inputs to farmers and recovering the same from the cane price in easy installment; thereby both could be benefited.

Ramesh (1980) stated that the sugar industry in India is the second-largest processing industry in the country next only to textiles. There are 320 factories producing annually 65.70 lakh tonnes of sugar. The aggregate assets of the industry are more than Rs.1300 crore. About 30 million cultivators are engaged in growing sugarcane and supplying the Same to sugar factories. The sugar industry distributes about Rs.800 crore annually towards sugarcane prices. It contributes more than Rs.300 crore annually to state and central exchequer. The factories are ideally suited for faster rural socio-economic development. The prosperity of the sugar industry is, therefore, closely linked with the development and prosperity of our vast population resident in the villages.

Shah and shah (1980) studied that the cost of production of sugar factory depends Primarily on raw materials sugar recovery percentage and the duration of the crushing Season They suggested that, the cost of sugar production can be brought down by utilizing the processing unit for a maximum period, by proper checking of the machinery by reducing cost of extra fuel, lubricants, spare parts, consumption of chemicals and sugar content in final molasses. It must be ensured that the steam balance and machinery are maintained with proper plans and proper watch of boiling house stations.

Mane (1980) stated that the sugar co-operatives had blazed a trail inefficiency only to accelerate the economic improvement of the farmers. There is a raise in their level of income, saving investment, mostly in productive assets, possession of farm machinery, credit worthiness, and employment opportunities.

Ksar & Tilekar (1983) indicated that the sugar industry has a significant impact on the employment of seasonal migrants in Maharashtra. The share of sugar factory employment was to the extent of 65.36, 45.51 & 75 percent in the total employment of an average male, female and bullock pair of the household respectively As regards the income, it is noted that the sugar industry, on an average contributes 57 percent of the gross income of the house hold. The seasonal employment provided by the sugar industry enabled the migrants to increase their income to enjoy a slightly better position as compared to the non-migrants under study. Hence, the policy has been endorsed for the installation of agro-processing industries based on local raw material opportunities for the economic development of weaker sections.

Nikam (2005) attempted to study the financial strength of four co-operative sugar factories situated in the Aurangabad district. The important ratio viz current ratio and Acid test ratio were employed to locate the financial strength of these units (short terms) and two ratios viz. Debt equity ratio and net fixed assets to net worth ratio were used for assessing the long-term financial strength of the societies.

Narasziah (2006) analyzed cash management in Kovur Co-operative Sugar factory Nellore in Andhra Pradesh. He analyzed cash and bank balances as percentage to the current assets, current ratio, liquid ratio, and cash flow coverage ratio. The study indicated low cash and bank balances when compared to current assets, which resulted in very low liquid assets. Inventory occupied a major portion in current assets, and the net cash flow coverage ratio of the factory was negative due to inconsistent and insufficient maintenance of liquidity.

Muralidharan (2008) made a comparative study of processing sugar cane into sugar, gur, and khandasari. He found that nearly 63.23percent of processing costs farmed fixed items in sugar units, and this was mainly because of the inclusion of salaries and wages of permanent staff. In the case of khandasari unit, fixed costs constituted 17.29 percent, and variable cost 82.71 percent.

While in the case of our unit, fixed costs accounted for 30.78 percent, and variable costs 69.22 percent. In the case of gur unit, labor cost was directly linked to the quantity of gur produced, indicating that an increase in the quantity of gur would reduce the per-unit cost. He found processing cane into gur was more profitable and compared to sugar and khandasari.

T.S.Devaral (2010) conducted an extensive study on the Agro-Based Industry in Karnataka. The study was emphasized on sugarcane production, sugarcane growers, and the major problem faced by the sugar industries in the study area.

With this background, the present paper has been brought out to examine the following objectives:

Objectives

- To examine the level of sugar cane production in India'
- To study the number of companies engaged in sugar production.
- To assess the performance of sugar production in India.

Global Scenario on Sugar Production

Data on area, production, and productivity of sugarcane in the world as a whole as also in the major sugarcane producing countries during 2005 vis-a-vis 2004 are presented in Table 1.

Table 1: Sugarcane area, Production and Productivity in Major Sugarcane Producing Countries during 2004 and 2005

Country	2004			2005		
	Area (ha.)	Production (tonnes)	Productivity (kg/ha.)	Area (ha.)	Production (tonnes)	Productivity (kg/ha.)
Australia	415000	36892000	888	420000	38246000	91062
Brazil	5571400	410983008	73767	5767180	420120992	72847
China	1352500	135620585	100274	1414000	92130000	65156
Colombia	440000	37100000	84318	431781	39849240	92290
Cuba	700000	24000000	34286	400000	12500000	31250
India	4100000	244800000	59707	3750000	232320000	61952
Indonesia	360000	24600000	68333	350000	25500000	72857
Mexico	639061	45126500	70614	639061	45126500	70614
Pakistan	1074000	53419000	49738	966300	47244100	48892
Philippines	380000	28000000	73684	380000	31000000	81579
South Africa	305000	19094760	62606	312000	21725100	69632
Thailand	1050000	111176100	105882	1066880	49572000	46464

USA	379680	26320150	69322	387250	25803000	66634
Vietnam	287000	15879600	55330	280000	15000000	53571
Others	3219343	110637274	34366	3214132	197082158	61317
World	**20272984**	**1323648977**	**65291**	**19778584**	**1293220050**	**65385**

Source: 1. Faoslat Citation 2005; 2. Website of FAO: www.fao.org

It is observed from Table 1 that the area under sugarcane in the world marginally decreased from 20.27 million ha. In 2004 to 19.78 ha. In 2005. This led to a decrease in the production of sugarcane during the same period from 1323.65 million tonnes to 1293.22 million tonnes. However, during the same period, the yield per hectare of sugarcane marginally increased from 65.29 tonnes to 65.38 tonnes. During the same period, the area under sugarcane increased from 5.57 million ha. To 5.77 million ha in Brazil and from 1.35 million ha to 1.41 million ha in China. However, in the case of India, the area under sugarcane decreased from 4.1 million ha to 3.75 million ha. While the increase in the area under sugarcane in Brazil led to an increase in the production of sugarcane from 410.98 million tonnes to 420.12 million tonnes, the increase in the area under sugarcane in China led to a decrease in the production of sugarcane from 135.62 million tonnes to 92.13 million tonnes. This is because the yield per hectare of sugarcane marginally decreased from 73.77 tonnes to 72.85 tonnes in Brazil and substantially decreased from 100.27 tonnes to 65.16 tonnes in China. In India, even though the decrease in area under sugarcane was associated with a marginal increase in the productivity of sugarcane from 59.71 tonnes to 61.95 tonnes, there was a decrease in the production of sugarcane from 244.80 million tonnes to 232.32 million tonnes. Thus, the impact of the decrease in area under sugarcane on sugarcane production in India was quite high.

Sugarcane Production in India

Table 2 indicates the figures of the area under sugarcane yield of sugarcane. Production of sugarcane. The number of factories, working capacity. Cane crushed, recovery. Sugar production, duration, and molasses production from 2004-2005 to 2017-18.

Table 2: Performance of Sugar and Sugar Cane Production in India during 2004-05 to 2017-18

Year	Area under Sugarcane (000 hectares)	Yield of cane (tonnes per hectare)	Production of sugar-cane (000 tonnes)	No. of factories in operation	Average Total Actual cane capacity crushed (tonnes) ('000 per 24 tonnes) hrs		Recovery of sugar percent cane	Total sugar produced (000 tonnes)	Average Molasses duration production (days) ('000 tonnes)	
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
2004-05	3661	64.8	237088	400	3545	124771	10.17	12691	96	5514
2005-06	4202	66.9	281172	453	3606	188672	10.22	19267	126	8551
2006-07	5151	69.0	355520	504	3474	279249	10.17	28361	174	13109
2007-08	5055	68.9	348188	516	3546	249906	10.55	26356	149	11313
2008-09	4415	64.5	285029	488	3725	144978	10.03	14538	.87	6542
2009-10	4175	70.0	292302	490	3825	185548	10.20	18912	108	8400
2010-11	4885	70.1	342382	527	3650	239807	10.17	24394	136	10970
2011-12	5106	69.3	353768	529	3868	256975	10.25	26342	137	11824
2012-13	5279	67.1	354400	526	4125	250598	10.03	25140	126	11744
2013-14	534.1	64.7	345600	509	4088	238464	10.23	24396	125	10882
2014-15	5307	69.1	366800	538	4101	273046	10.37	28310	135	12482

2015-16	5284	63.7	336900	526	4192	236492	10.62	25125	117	10873
2016-17	4945	61.3	303600	493	4337	194078	10.44	20285	99	9026
2017-18	5042	81.5	411000	525	4488	302427	10.74	32479	140	14063

Sources: Note: hectare =2.4711 acre

Table 3: State-wise Sugarcane Cultivation in India (Thousand Hectares)

States	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Assam	29	27	30	-	-	-	-	-	.	.
A.P & Telangana	196	158	192	204	190	195	210	190	186	177
Bihar	112	116	248	170	252	298	302	280	296	300
Gujarat	221	154	190	194	203	182	185	185	180	182
Haryana	90	74	85	95	100	118	115	116	120	122
Kerala	2	3	3	-	-	-	.	-	-	
Maharashtra	768	756	965	1025	937	940	1060	1050	765	915
M.P. & Chhattisgarh	70	62	65	81	80	85	131	155	150	140
Karnataka	281	337	423	432	427	476	499	510	410	415
Orissa	11	8	13	40	40	42	30	30	43	35
Punjab	81	60	70	95	95	96	98	100	105	105
Pondicherry	2	2	-	-	-	-	-	.	.	.
Rajasthan	6	6	5	-	-	-	-	-	.	_
Tamil Nadu	309	293	316	335	320	285	255	250	260	201
Uttar Pradesh	2084	1977	2125	2252	2475	2513	2307	2302	2310	2330
Uttarakhand	107	96	107	108	110	111	115	116	120	120
West Bengal	18	14	15	-	-	-	-	_	-	-
Others	28	32	33	75	50	-	-	-	-	-
Total	**4415**	**4175**	**4885**	**5106**	**5279**	**5341**	**5307**	**5284**	**4945**	**5042**

Sources: From 2011-12 onwards data has been extracted from ISMA Satellite Mapping

It is observed from table 3 Uttar Pradesh is the leading state in cultivating sugarcane crops in India. Maharashtra in another state given more importance to sugar cane cultivation Bihar, Gujarat, Haryana, Uttarkhand, Madhya Pradesh, and Chhattisgarh focus moderate level of cultivation. In the case of South India, It is Karnataka, and Tamilnadu Andhra Pradesh and Telangana have shown a considerable amount of cultivating sugar cane crops. It is also very clear that starts like Assam, Kerala, Pondicherry (UT) Rajasthan, and West Bengal are shown a dismal feature of sugarcane cultivation.

Table 4: State-Wise Production of Sugarcane in India (Thousand Tonnes)

States	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Assam	-	-	1075	-	-	-	-	-	-	.
A.P & Telangana	15912	14300	14964	15912	14300	14000	13900	12400	9500	11500
Bihar	8500	12600	12763	8500	12600	14900	14900	13900	14700	18500
Gujarat	13386	14400	13760	13386	14400	13300	13200	13800	10800	13100
Haryana	6745	7100	6042	6745	7100	8100	7900	7500	8600	10100

Kerala	-	-	272	-	-	-	-	-	-	-
Karnataka	38966	37100	39657	38966	37100	41900	46700	39700	24600	39200
Maharashtra	78925	73600	81896	78925	73600	75200	98900	80000	45900	99100
M.P. & Chhattisgarh	2795	3300	2667	2795	3300	4900	7900	7800	8100	10000
Orissa	204	2000	903	204	2000	2100	1500	1500	1600	1400
Punjab	5633	6300	4170	5633	6300	6300	6600	7400	7800	8800
Pondicherry	-	-	278	-	-	-	-	-	-	-
Rajasthan	-	-	368	-	-	-	-	-	-	-
Tamil Nadu	35309	30100	34252	35309	30100	25700	22300	24500	21000	12100
Uttar Pradesh	126112	141100	120545	126112	141100	133200	126900	122500	144100	179400
Uttarakhand	6426	6600	6498	6426	6600	6000	6100	5900	6900	7800
West Bengal	-	-	1134	-	-	-	-	-	-	-
Others	1300	6000	1138	1300	6000	0	-	-	-	-
Total			**342382**	**353768**	**354400**	**345600**	**366800**	**336900**	**303600**	**411000**

Sources: From 2011-12 onwards data has been extracted from ISMA Satellite Mapping

It is very clear from table 4 that sugar production in the Indian state revealed that Uttar Pradesh and Maharashtra play a significant role in the production of sugar cane followed by other states' signs Bihar, Gujarat, Haryana, Madhya Pradesh, and Chhattisgarh and Orissa. Similarly, Karnataka performs a leading role in the production of sugar cane, which is followed by Tamil Nadu and Andhra Pradesh.

Table 5: State-Wise Yield of Sugarcane in India (Tonnes Per Hectare)

States	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Assam	37.9	39.1	36.2	-	-	-	-	_	-	-
A.P & Telangana	78.5	74.1	77.9	78.0	75.0	72.0	66.0	66.0	51.0	65.0
Bihar	44.3	43.4	51.4	50.0	50.0	50.0	50.0	50.0	50.0	62.0
Gujarat	70.2	80.5	72.4	69.0	71.0	71.0	71.0	75.0	60.0	72.0
Haryana	57.0	72.1	71.0	71.0	71.0	69.0	69.0	65.0	71.0	83.0
Karnataka	83.0	90.3	93.7	90.2	87.0	88.0	94.0	78.0	60.0	94.5
Kerala	125.0	95.0	95.5	-	-	-	-	-	-	-
M.P. & Chhattisgarh	42.2	40.8	41.0	34.5	41.0	57.0	60.0	51.0	54.0	71.0
Maharashtra	78.9	84.8	84.9	77.0	78.5	80.0	93.0	76.0	60.0	108.0
Orissa	59.8	61.2	68.9	51.0	51.0	50.0	50.0	50.0	38.0	40.0
Punjab	57.6	61.6	59.6	60.0	66.0	66.0	67.0	74.0	74.0	84.0
Rajasthan	59.7	57.4	66.9	-	-	-	-	-	-	-
T.N.& Pondy.	99.7	101.4	108.4	1050	94.0	90.0	88.0	98.0	81.0	60.0
Uttar Pradesh	52.3	59.2	56.7	56.0	57.0	53.0	55.0	53.0	62.0	77.0
Uttarakhand	52.2	60.8	60.9	59.5	60.0	54.0	53.0	51.0	57.0	65.0
Others	22.7	33.8	34.5	-	-	-	-	-	-	-
All India	**64.5**	**70.0**	**70.1**	**69.3**	**67.1**	**64.7**	**69.1**	**63.7**	**61.3**	**81.5**

Sources: From 2011-12 onwards data has been extracted from ISMA Satellite Mapping

With regards to state wise yield of sugarcane in India presented is table 5 reveals that Maharashtra is the leading state, which has overcome the level of production of Uttar Pradesh. Fortunately, Karnataka and Punjab perform is second and third place. During 2011-12 onwards, no production has been carried out in the state of Assam, Kerala, and Rajasthan.

Performance of Sugar Industries in India

Table 6: State-Wise Number of Centrifugal Sugar Factories Working in India

States	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Assam	-	-	-	-	-	-	-	-	-	-
Andhra Pradesh	35	35	37	37	36	24	22	19	18	18
Bihar	9	9	10	11	11	11	11	11	11	11
Goa	1	1	1	1	1	1	1	1	1	1
Gujarat	18	18	19	19	18	18	20	21	20	17
Haryana	15	14	14	14	14	14	14	14	14	14
Kerala		-	-	-	-	-	-	-	-	-
Karnataka	50	54	59	58	60	62	65	64	64	66
Madhya Pradesh	9	11	13	13	12	14	16	17	17	18
Maharashtra	147	143	167	170	172	157	183	180	152	187
Orissa	5	4	5	5	5	5	3	3	3	2
Punjab	16	15	16	17	16	16	16	16	16	16
Puducherry	1	1	2	2	2	2	2	1	1	m
Rajasthan	1	1	1	1	1	1	1	1	1	1
Tamil Nadu	37	41	44	43	43	42	43	42	39	36
East U.P	44	42	42	42	40	38	38	38	38	38
West U P.	35	35	34	33	33	33	32	31	31	48
Central U.P.	53	51	49	49	49	48	48	48	47	4
West Bengal	1	1	1	1	1	1	1	1	1	1
Uttarakhand	10	10	10	10	9	9	9	8	8	7
Chhattisgarh	1	3	3	3	3	3	3	3	4	4
Telangana						10	10	7	7	7
All India	488	490	527	529	526	509	538	526	493	525

About the number of sugar factories in India for the period from 2008-09 to 2017-18 presented in table 6. The table 6 indicates that there are no sugar industries found in Assam, Kerala, where as in the state of Telangana, sugar factories are missing for the period from 2008-09 to 2012-13. Another noteworthy feature of the above table implies that there is only one sugar factory run in the state of Goa and Rajasthan the highest number of sugar factories are found in the state like Maharashtra (187), Uttar Pradesh (90), Karnataka (66) and Tamil Nadu (36). Rest of the state only a few sugar factories are working.

Table 7: State-Wise Cane Crushed By Centrifugal Sugar Factories in India (Thousand Tonnes)

States	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Assam	-	-		.	-	-	.	.	_	.
A. P.	5993	5546	10317	11588	10299	6942	6014	5894	4116	4885
Bihar	2370	2723	4141	4761	5716	6591	5724	5147	5711	7479
Goa	108	100	146	116	108	127	125	101	47	74
Gujarat	9445	11295	12359	9432	10493	10603	11147	11245	8368	10476
Haryana	2528	2648	4346	5430	5245	5718	5794	5120	6454	8124
Kerala	-	-	-	-	-	-	-	-	-	-
Karnataka	16104	23977	33765	34753	33320	38140	44641	37714	21252	35427
Maharashtra	40022	61390	80223	77063	70047	67646	93116	74383	37346	95360
M.Pradesh	581	853	1700	1639	1944	3277	3968	3465	3685	4636
Nagaland	-	4	-	-	-	-	-	-	-	-
Orissa	327	251	519	731	719	680	455	518	405	377
Punjab	2603	2112	3433	4271	4796	4972	5695	6671	6760	6421
Puducherry	166	225	546	720	632	608	359	68	66	-
Rajasthan	42	48	49	29	52	67	78	89	119	77
Tamil Nadu	16606	14328	20310	25455	21457	15760	14051	15586	11904	8240
U.P.	45482	56734	64381	76855	81506	70117	74453	64479	82716	111190
East U P.	14353	17124	21273	26624	27767	24182	24175	20462	24874	33437
West U.P.	15864	19507	19981	21521	23824	21348	22752	19526	26368	33222
Central U.P	15265	20103	23127	28710	29915	24587	27526	24491	31474	44531
West Bengal	29	29		56	54	71	59	8	7	7
Uttarakhand	2421	3175	3235	3641	3693	3222	3516	2837	3506	4091
Chhattisgarh	151	110	268	435	517	771	787	609	500	1080
Telangana						3152	3067	2558	1116	2483
All India	**144978**	**185548**	**239807**	**256975**	**250598**	**238464**	**273046**	**236492**	**194078**	**302427**

Sources: From 2011-12 onwards data has been extracted from ISMA Satellite Mapping

With regards to state wise cane crushed by centrifugal sugar factories in India presented in table 7 indicates that the states like Assam, Nagaland, and Kerala have been ruled out in the sugar and sugar-related production activities. Table 7 further reveals that compared to 2016-17, almost all the sates perform better in crushing of sugar cane activities during 2017-18. As usual, the agrarian state like Uttar Pradesh stood top among other states in the crushing of sugar cane, which is followed by Maharashtra and Karnataka. Another noteworthy feature of table 7 is the performance of crushing activities is Tamil Nadu is continually decreasing from 2012-13 expect 2015 and 2016.

Table 8: State-Wise Average Recovery of Sugar Percent in India

States	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Assam	-	-	-	-	-	-	-	-	-	-
Andhra Pradesh	9.89	9.28	9.75	9.79	9.64	9.74	9.38	9.35	9.37	9.53
Bihar	9.04	9.49	9.30	9.45	8.86	8.97	9.18	9.77	9.21	9.58
Goa	8.72	8.17	8.66	9.02	8.89	9.49	9.19	9.60	8.38	7.92

Gujarat	10.72	10.53	9.99	10.61	10.77	11.09	10.34	10.38	10.58	10.55
Haryana	9.05	9.37	9.01	9.10	9.76	9.44	9.94	10.52	10.34	10.39
Kerala	-	-	-	-	-	-	-	-	-	-
Karnataka	10.28	10.67	10.91	11.14	10.40	10.95	11.06	10.74	10.19	10.60
M.P.	9.63	9.40	9.66	9.69	9.78	9.91	9.73	9.84	9.74	9.82
Maharashtra	11.44	11.51	11.26	11.65	11.41	11.40	11.29	11.33	11.25	11.24
Dadar Nagar Haveli	-	2.44	-	-	-	-	-	-	-	-
Orissa	9.44	9.01	8.70	8.89	8.58	8.91	9.38	9.28	9.40	9.34
Punjab	9.29	8.59	8.80	9.13	9.13	9.43	9.42	10.06	9.78	9.78
Puducherry	10.02	8.30	8.71	8.86	8.40	8.59	8.89	7.60	8.37	-
Rajasthan	8.82	7.80	7.73	7.66	7.86	8.18	8.31	5.88	8.55	9.02
Tamil Nadu	9.62	8.97	9.09	9.35	8.88	8.97	8.67	8.74	8.92	8.64
Uttar Pradesh	8.94	9.13	9.14	9.07	9.18	9.26	9.54	10.61	10.61	10.84
East U P.	8.99	9.22	9.31	9.44	9.36	9.60	9.57	10.90	10.55	10.64
West U.P.	8.83	9.13	8.92	8.55	8.99	8.86	9.31	10.16	10.31	10.82
Central U.P.	9.00	906	9.18	9.12	9.17	9.29	9.70	10.72	10.89	10.99
West Bengal	6.44	7.04	7.18	8.10	8.35	8.35	8.36	6.63	7.18	5.21
Uttarakhand	9.20	9.19	9.35	9.10	9.13	8.90	9.24	9.61	9.85	10.24
Chhattisgarh	8.43	7.82	8.72	8.21	9.51	8.85	8.20	9.43	9.49	8.81
Telangana						10.52	10.51	10.85	10.38	10.84
All India	**10.03**	**10.20**	**10.17**	**10.25**	**10.03**	**10.23**	**10.37**	**10.62**	**10.44**	**10.74**

Sources: From 2011-12 onwards data has been extracted from ISMA Satellite Mapping

Table 8 reveals the information about the state-wise average recovery of sugar percent in India. The sate like Assam, Kerala Dadar Nagar Haveli, is found to be nil during the year 2017-18. The performance of Tamil Nadu, Orissa, and Maharashtra showed a marginal decline in the percentage of performance. Where Andhra Pradesh, Bihar, Haryana, Uttarakhand have shown better performance, compared to the previous year 2016-17.

Table 9: The state-wise average duration of crushing season in India

States	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Assam	-	.	-	-	-	-	-	-	-	.
A.P.	72	63	106	113	101	97	92	104	81	93
Bihar	59	66	96	97	116	126	101	94	104	126
Goa	78	73	108	90	81	94	98	78	43	60
Gujarat	125	150	175	137	145	157	161	139	102	148
Haryana	65	60	109	146	136	150	143	136	168	205
Kerala	-	-	-	-	-	-	-	-	-	-
Karnataka	96	126	169	152	134	138	151	120	77	116
M.P.	44	55	79	73	89	133	130	92	96	109
Maharashtra	89	143	164	147	125	125	149	116	67	137
Dadar Nagar Haveli	-	6	-	-	-	-	-	-	-	-

Orissa	46	43	71	90	80	80	74	77	63	87
Punjab	66	54	77	102	112	116	128	136	133	156
Puducherry	113	75	161	206	186	178	103	56	54	.
Rajasthan	51	60	60	39	63	78	92	91	99	58
Tamil Nadu	165	148	178	202	174	135	125	147	118	97
Uttar Pradesh	72	84	103	124	129	120	125	111	139	178
East U.P.	64	74	92	115	128	121	120	101	117	157
West U.P	89	99	114	130	133	130	138	126	162	190
Central U.P.	67	83	105	127	128	112	120	108	141	187
West Bengal	22	26	63	53	53	74	63	9	8	8
Uttarakhand	75	86	96	110	113	102	115	107	117	146
Chhattisgarh	69	20	49	76	85	120	119	90	70	122
Telangana						110	105	114	60	122
All India	**87**	**108**	**136**	**137**	**126**	**125**	**135**	**117**	**99**	**140**

Sources: From 2011-12 onwards data has been extracted from ISMA Satellite Mapping

Table 9 reveals that the status of Haryana, Uttar Pradesh showed a real performance with regards to a number of days carried out of crushing activities. Even the state of Punjab, Bihar, Gujarat, and Maharashtra performed well for the crushing. Tamil Nadu has shown a declining trend and in the case of Karnataka and Telangana have done a remarkable job in the year 2017-18 compared to 2016-17

Major Findings

The area under sugarcane cultivation in the world is marginally decreased to 20.27 million ha. In 2004 to 19.78 million ha. In 2005. This led to a decrease in sugar cane production.

Major sugarcane produced in Uttar Pradesh, Maharashtra, stood in second place. In Southern India both Karnataka and Tamilnadu were the largest in sugarcane production.

It has been observed that Uttar Pradesh is the leading State in the production performance of sugar production. Similarly, in the Southern State, Karnataka performed a leading role in the production of sugar.

It has been observed that the States like Assam, Kerala, and Rajasthan sugarcane cultivation is almost negligible.

It is also observed that there are no sugar industries found in Assam and Kerala. In the case of Telangana, there were no sugar factories from 2009 to 2013.

It is further observed that the States like Assam, Nagaland, and Kerala has been ruled out in the sugar and sugar-related production activities.

It has been further observed that Karnataka and Telengana have done a remarkable job regarding crushing activities during 2017-18 compare to 2016-17.

Conclusion

Thus sugar industries in India play a pivotal role. The major contribution of significance crops comes from few states Viz., Uttar Pradesh, Maharashtra, Haryana, Gujarat, Karnataka, Andhra Pradesh, Tamil Nadu. It is at a very lower level, or almost the crop is missing in these state viz., Punjab, Assam, Orissa, West Bengal Rajasthan, and Pondicherry Besides, India is one of the longest sugar-producing countries next only to Brazil. It also undertakes the export of sugar to other countries. Further among the south Indian states, Karnataka is one of the south Indian states in sugar cane cultivating and sugar production. The details of the production performance in clearly presented in the next Chapter.

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Author Details

G. Shivagami, *Research Scholar & Professor, Department of Economics, Bangalore University, Bangalore, Karnataka, India.*

T. Rajendra Prasad, *Professor, Department of Economics, Bangalore University, Bangalore, Karnataka, India,* ***Email ID:*** *trprasadbub@gmail.com.*