
An Analysis of Sugarcane Consumption: Across the Regions of India

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Abstract

The present study is on overall growth of sugarcane area, production and productivity during the period of 1950 to 2015 of 7 decades of India. The sugarcane sector considers as the area under sugarcane, production and productivity only. A majority of states are growing the sugarcane in India. All the sugarcane states have been divided in to three regions as per the agro-climatic conditions. Those are Sub-tropical, Tropical and the rest of India. In sub-tropical regions the states of Uttar Pradesh, Haryana, Punjab, Bihar and Jharkhand states. In the Tropical region, Karnataka, Tamil Nadu, Maharashtra, Andhra Pradesh, Gujarat, Madhya Pradesh. In the rest of India region, Kerala, West-Bengal, Jharkhand, Rajasthan, Uttaranchal Chathieshghad and Telangana are the main states. All the regions are growing the sugarcane but not uniform nature. During the period 1950 – 2015 the production of sugarcane increased by 435451 TMT and the productivity is increased by 81.5 MT per hector. In this connection the present research paper made an attempt on the utilization of sugarcane across the regions of India during the 7 decades. The main objectives are to find out the distribution of sugarcane, production, to find out the utilization of sugarcane in between factories and cottage industries in the three regions of India during the 7 decades of India. The region-wisedistribution of production and consumption of sugarcane among the three regions are the core content. The paper is based on the secondary source of data only, which is gathered by the RBI statistical hand book, Indian Sugar Mills Association and Indian co-operative sugars etc.

Keywords: Sugarcane, Growth rates, Production, Productivity Variations

(SCS- Sugarcane Crushed for Sugar, SUJK – Sugarcane Utilization for Jagary & Khandasari, TSP – Total Sugarcane Production)

Introduction:

Sugarcane is an important commercial and important raw material for the sugar industry. Sugarcane is one of the agro-based industrial crops, at Global level more than 100 countries are cultivating in the Tropical and Sub-tropical zones. According FAO 2015 statistics, the Top Ten countries of sugarcane cultivating countries are Brazil, India, China, Thailand, Pakistan, Mexico, Indonesia, Philippians, Australia, Argentina are cultivating the more than 90.0 percent of global sugarcane production. The top ten sugarcane yielding countries are Australia, with 81.3 MT per Hectare, followed by 76.64, 74.39, 71.3, 70.64, 70.25, 66.54, 60.50, 57.93 and 55.0 Metric Tons per hectare by the Thailand, Mexico, China, Brazil, India, Argentina, Indonesia, Philippians and Pakistan respectively¹.

In India, sugar industry is the second largest after cotton textiles which contribute around 6.0 percent of the agricultural GDP. Sugarcane is the main source of sugar about 80.0 percent and it is one of the sources for earning foreign exchange. The sugarcane as the raw material for white sugar, brown sugar (Khandsari), jaggery (gur) and ethanol too². According to the Ministry of Agriculture and Farmers Welfare, it is estimated that about 50 million farmers and their households are directly depending on sugarcane production and about 0.5 million skilled and unskilled workers are engaged in sugar factories and its allied industries. India's total area under sugarcane production is 5.45 million hectares in 2014 – 15 for and total sugarcane production at 415.5 MMT³.

India is the second-largest producer of sugarcane in the world after Brazil. The weather conditions are very suitable for cultivation of sugarcane in India. The sugarcane cultivating states are divided three regions, Sub-Tropical Region (STR), Tropical Region (TR), and Rest of India Region (RIR). The region-wise main sugarcane growing states are Uttar Pradesh, Haryana, Punjab, Bihar and Jharkhand states are in STR. In TR the important sugarcane growing states are Karnataka, Tamil Nadu, Maharashtra, Andhra Pradesh, Gujarat, Madhya Pradesh, Chhattisgarh and Telangana. The RIR is mainly Assam, Kerala, Odisha, and West Bengal and Rajasthan are major states cultivation sugarcane in RIR. Rest of the states are as per the climatic conditions some of the states are having sub-tropical climate based weather conditions and some are in tropical climate based weather conditions. These states are very nominal share of area and production of sugarcane, after 2010 these states are also getting the importance. As such, the rest of the Indian states considered as separate region.

Review of Literature:

JV Arun and A. Premkumar (2022) in between 2001 to 2015 Indian sugarcane production, area and yield have been observed as 1.4, 0.5 and 0.9 percent respectively⁴. Bharat et al. (2015) found that in area, production and productivity fluctuations among the sugarcane growing states during the period of study. At national level sugarcane area was decline trends have been observed from 2015 onwards, it is due to crop, shift in some of the regions⁵. Shiva Pujan Singh (2014), in Bihar sugarcane cultivation has been fluctuations was observed during the period of study as 1970 to 2012 of 42 years, production and productivity have been positively responded in the selected districts⁶. Priyanka Upreti and Alka Singh (2014) found that yield was remained stagnant, but the sugarcane production has increased by expansion of area under sugarcane since the long time in Uttar Pradesh and Maharashtra⁷. Dr. Tarun Kumar Upadhyay (2015) area under the sugarcane and productivity has significant growth was observed in the state of Uttar Pradesh during the 20 years of the study⁸.

The above reviews are mentioned the major indicators the area, production and yield of sugarcane sector on the secondary data based in India. The region level studies are very rare, even though, those are limit to two regions of Sub-tropical and Tropical only, they ignored the rest of the states. These studies were covered for 20 to 40 years, but not entire 7 decades of Indian sugarcane sector. Thus, the present study made an attempt on the distribution of Sugarcane and consumption of sugarcane for the manufacture of sugar and jaggery&Khandsari across the regions of India during the period of 1951 to 2015 as the 7 decades.

Methodology:

The data base for the study is purely secondary data. The secondary data collected on area, output and yield of sugarcane through the Indian Co-operative Sugars ltd, hand book statistics of RBI, Indian Sugar Mills Association and Statistical Abstracts of India etc. The time series data on the three aspects for the period of 1950 to 2015 as 70 years of Indian states, later all the states spilled in to three regions as Sub-tropical states, Tropical states and the remaining states were considered as the Rest of India Region.

Objectives:

The present research paper has been adopted main objectives as follows

1. To study the distribution of sugarcane production and the overall growth and annual compound growth rates among the regions of India during 7 decades.
2. To find out the consumption of sugarcane in between sugar factories and cottage industries during the period of study.

To justify the objectives the study has been work out the 4 simple average and percentage tables with the help of secondary source of data. The tables have been worked out on the available time series data. And at the same time the region-wise variations have been estimated with the base year to current year.

Table – 1
Distribution of Sugarcane Production during 7 decades: Across the Regions of India(Sugarcane Production in 1000 MT)

Decade	Sub-tropical		Tropical		Rest of India		Total India	
1950-51	49520	70.28	17454	24.77	3484	4.94	70458	49520
1951-60	73463	65.85	33021	29.60	5081	4.55	111565	100.0
1961-70	68088	56.25	46368	38.31	6579	5.44	121035	100.0
1971-80	76040	49.30	70142	45.47	8066	5.23	154248	100.0
1981-90	127967	52.68	107519	44.27	7409	3.05	242895	100.0
1991-2000	125996	42.57	157746	53.30	12214	4.13	295956	100.0
2001-10	143521	41.92	187196	54.67	11665	3.41	342382	100.0
2011-15	204412	46.94	182360	41.87	48679	11.17	435451	100.0
Overall Growth Rate 1951 - 2015	313.0		945. 0		1297.0		518.0	
Compound Annual Growth rate	4.5		13.5		18.5		7.4	

Source: Computed data from ISMA & ICS

Table – 1 denotes the distribution of the sugarcane production during the 7 decades of Independent India. In the beginning of planning era the total cane production is 70458 thousand tons and by end of 2014 -15 agriculture season the cane production has been raised to 435451 thousand tons the overall growth rate of the cane production is 518.0 percent and the compound annual growth rate is 7.4 percent at national level. In the RIR states have been noted the remarkable changes during the period of study, in the initial stage the total cane production is 3484 thousand tons and in the end of 2014-15 sugarcane production is 48679 thousand tons, the overall growth rate has been

worked out as 1297.0 percent and the annual growth is 18.5 percent. In the TR states, sugarcane production is 17454 thousand tons and the end of point year it raised 182360 thousand tons and the overall production increased by 945.0 percent and the annual compound growth rate is 13.5 percent. Coming to the STR states 49520 thousand tons in the beginning year and it was raised to 204412 thousand tons by end of 2014-15 and the overall and compound annual growth rates are 313.0 and 4.5 percent respectively.

In the meanwhile, we look into the region wise and decade wise cane distribution in all the decades RIR states production share is insignificant accept current decade of 2011-2015 in this decade it is about 11.0 percent as somewhat considerable share. The regions of STR and TR both the regions share is considerable level. In the decades of 1991-2000 and 2001 – 2010 subsequent decades the TR states more than 54.0 and 53.0 percent respectively. The remaining decades the STR states are far head than the TR and RIR states.

The cane production mainly contributed by the regions of STR and TR states it is main reason behind that the more favorable climatic and weather conditions.

Table – 2 shows the particulars of region and decade-wise crushed cane by the sugar factories during the period of the study as 1951 -2015 of 7 decades in India. At national level in the base year 11418 TT of cane crushed by the sugar factories and it was raised by 301000 TT in the end of last decade 2011-2015 and the Overall Growth Rate has been worked out as 2536.0 percent and the Compound Annual Growth Rate is 36.0 percent as the significant. In the RIR states at the initial stage sugarcane crushed as 79 TT and its share is 0.69 percent to the total cane crushed in India. By the end of decade the total crushed increased by 5415 TT and the OGR is 6754.0 and the CAGR is 96.0 percent as the highest percent than the rest of two regions of India. The crushed cane share as the lower 1.8 percent and it is very insignificant. Over the decades the share of crushed cane is little bit of improvement. In the TR states in the base year 2860 TT of cane crushed by the factories and its share is about 25.0 percent to the total crushed cane in India, in the end of the last decade 2011 -2015 the crushed cane raised by 174887 TT and its share is significantly raised by 58.0 percent to total crushed cane of India. The OGR is 6014.0 percent and the CAGR is 86.0 percent. Look into the STR states in the initial year the crushed cane is 8479 TT and its share as the highest 74.0 percent, in the end of 2011 -2015 the crushed cane as remarkable improvement as 120698 TT and at the same time the share has been dropped as 40.0 percent. The OGR and CAGR of this region as 1323.0 and 19.0 percent as significant but at the same time both the growth rates are comparatively lower than the rest of Two regions of India.

Table – 2

Crushed Sugarcane by Factories during 7 Decades: Across the Regions of India (crushed cane in 1000 MT)

Decade	Sub-tropical		Tropical		Rest of India		Total India	
1950-51	8479	74.26	2860	25.05	79	0.69	11418	100.0
1951-60	20781	66.80	9451	30.38	877	2.82	31109	100.0
1961-70	18813	49.24	18687	48.91	704	1.84	38204	100.0
1971-80	18959	35.52	33828	63.38	588	1.10	53375	100.0
1981-90	48053	38.36	76430	61.01	787	0.63	125270	100.0

1991-2000	73520	39.46	112231	60.24	554	0.30	186305	100.0
2001-10	76301	32.29	158675	67.16	1301	0.55	236277	100.0
2011-15	120698	40.10	174887	58.10	5415	1.80	301000	100.0
OGR 1951 – 2015	1323.49		6014.0		6754.0		2536.0	
CAGR	19.0		86.0		96.0		36.0	

Source: Computed data from ISMA & ICS

Coming to the decade and regions wise cane crushed shares, the STR and TR states are at significant shares and the RIR states are at nominal percent in between 1.0 to 3.0 percent. The TR states share at decade wise, first three decades as increasing trend and 2001 to 2010 decade as the highest share as 67.0 percent and the lowest is in 1961 – 1970 decade as 49.0 percent. In the STR states highest share is in the first decade 1951-1960 as about 67.0 percent and in the 2001 – 2010 decade it is the lowest as 32.0 percent. In the Two regions TR is significantly improvement as 28.0 percent and at the same time STR has been reduced as 27.0 percent. The data indicates that the southern states TR as the significant improvement rather than the rest India regions. It is due to number of sugar factories and the area under sugarcane as positive directions.

Table – 3 reveals the particulars of utilized the sugarcane for the production of Jaggary and Khandasari across the regions of India during 7 decades from 1950-60 to 2011-15 of the study. In the base year total cane consumption for the preparation of Jaggary & Khandasari is 59040 TT and it raised by 134451 TT by the end of 2015 and its overall growth rate is 44.0 percent and compound annual growth rate is 0.62 percent at national level.

Table – 3

Distribution of Sugarcane Utilization for Cottage Industries: Across the Regions of India during 7 Decades

(Sugarcane for Jaggary & Khandasari in 1000 MT)

Decade	Sub-tropical		Tropical		Rest of India		Total India	
	Cane utility in 000 MT	%	Cane utility in 000 MT	%	Cane utility in 000 MT	%	Cane utility in 000 MT	%
1950-51	41041	69.51	14594	24.72	3405	5.77	59040	100.0
1951-60	52682	65.48	23570	29.30	4204	5.23	80456	100.0
1961-70	49275	59.49	27681	33.42	5875	7.09	82831	100.0
1971-80	57081	56.59	36314	36.00	7478	7.41	100873	100.0
1981-1990	79914	67.94	31089	26.43	6622	5.63	117625	100.0
1991-2000	52476	47.86	45515	41.51	11660	10.63	109651	100.0
2001-11	67220	63.35	28521	26.88	10364	9.77	106105	100.0
2011-15	83714	62.26	7473	5.56	43264	32.18	134451	100.0
OGR 1951 - 2015	49.0		(-51.0) 51.0		1270.0		44.0	
CAGR	0.70		0.73		19.0		0.62	

Source: Computed data from ISMA & ICS

In this regard RIR states are 3405 TT in the initial year and it raised by 43264 TT in 2020 and its growth rates are 1270 OGR and 19.0 percent of CAGR accordingly. The share of 5.7 to 32.0 percent in the same period, but the decade to decade the shares are flections not evenly due to various reasons behind the curtain. In STR the initial year 41041 TT of sugarcane crushed for the making of Jaggary and Khandasari and in the end of the 2015 year it rose to 83714 TT and its growth rates are 49.0 and 0.70 percent of OGR and CAGR respectively. In TR states 14594 TT of cane used for making of jaggary and khandasari by the cottage industries at village level. By the end of 2020 it was dropped as 7473 TT and the OGR and CAGR are – 51.0 and – 0.73 percent respectively.

Coming to the regions and decade wise shares of cane crushed by the cottage industry for the production of jaggary and khandsari, in all the decades the STR states are at the top share and followed by TR and RIR and at the same time RIR is insignificant in the decades of 1961-70, 1971 - 80, 1981-90 and 2001 – 2010 and the rest decades are at considerable. However, the data indicates that the cottage industries are more in the TR and STR regions. At the same time we can observe the percentage trends are decade to decade ups and downs have been observed from the data.

Table – 4

Distribution of Sugarcane Consumption for Sugar and Jaggary &Khandasari: Across the Regions of India during 7 Decades(Sugarcane in 1000 MT)

Decade	Sub-tropical			Tropical			Rest of India			Total India		
	SCS	SUJK	TSP	SCS	SUJK	TSP	SCS	SUJK	TSP	SCS	SUJK	TSP
1950-51	17.12	82.88	100.0	16.39	83.61	100.0	2.27	97.73	100.0	16.21	83.79	100.0
1960-61	28.29	71.71	100.0	28.62	71.38	100.0	17.26	82.74	100.0	27.88	72.12	100.0
1970-71	27.63	72.37	100.0	40.30	59.70	100.0	10.70	89.30	100.0	31.56	68.44	100.0
1980-81	24.93	75.07	100.0	48.23	51.77	100.0	7.29	92.71	100.0	34.60	65.40	100.0
1990-91	37.55	62.45	100.0	71.09	28.91	100.0	10.62	89.38	100.0	51.57	48.43	100.0
2000-01	58.35	41.65	100.0	71.15	28.85	100.0	4.54	95.46	100.0	62.95	37.05	100.0
2010-11	53.16	46.84	100.0	84.76	15.24	100.0	11.15	88.85	100.0	69.01	30.99	100.0
2011-15	59.05	40.95	100.0	95.90	4.10	100.0	11.12	88.88	100.0	69.12	30.88	100.0

Source: Computed data from ISMA & ICS

Table – 4 presents the distribution of sugarcane consumption for sugar and jaggary &khandasari across the regions during decadal wise points of the study in India. At national level sugarcane consumption is about 84.0 and 16.0 in the initial point of the study of Jaggary&Kandasari and Sugar respectively, it is 98.0 and 2.0 percent J&K and Sugar in RIR, in TR it is 84.0 and 16.0 percent of cane used for J&K and Sugar, and it is 83.0 and 17.0 percent of J&K and Sugar respectively in STR states in 1950-51.

In the current point of the study year 2015, the consumption of sugarcane for J&K is about 31.0 percent and the remaining about 69.0 percent at the all India level. In this connection the TR is 96.0 and 4.0 of cane used for the making of Sugar and J&K, in STR 41.0 and 59.0 percent of cane crushed for the production of sugar and J&K. But in the RIR 11.0 and 89.0 percent of sugarcane utilized for sugar and J&K respectively. In RIR all the points of the study a majority of sugarcane used for the production of J&K. In STR since 1951 to 1991 a majority of sugarcane as the raw

material for J&K. but in TR from 1951 to 1981 as the study points reported as the highest consumption of sugarcane for J&K. After the economic reforms in STR a major percent of sugarcane as the raw material for the production of Sugar instead of J&K, but in Southran states the decline of sugarcane as the raw material for J&K from 1981 onwards and viz a viz for the sugar production. But it is surprising that RIR a majority of sugarcane consumption for the J&K even today.

Conclusion:

Based on the far-going analysis on the region and decade-wise production of sugarcane, consumption of crushed cane for the production of sugar and J&K (Jaggary &Khandasari) and its contributory shares during the period of the study. The production of sugarcane initial stage to end of the year, the remarkable progress has been noted by the study it is 518.0 and 7.5 percent of Overall production Growth and Compound Annual Growth rates at national level in India for the period of 1951 to 2015 (7 decades), in this dimension RIR as 1297.0 and 19.0, TR is 945.0 and 13.5, in STR as relatively lower with 313.0 and 4.5 percent of OGR and CAGR respectively. The production shares are not even among the regions and even decades but the STR and TR states are at significant shares and RIR is insignificant. The crushed cane has been distributed among the three regions, but the distribution is not similar again the STR and TR regions both together more than 90.0 percent of shares. The OGR and the CAGR are 2536.0 & 36, 6754.0 & 96.0, 6014.0 & 86.0 and 1323.0 & 19.0 percentages of sugarcane consumption as the raw material by the sugar factories are at national level, RIR, TR and STR states respectively. The sugarcane not only raw material for sugar and but also for Jaggary and Khandasari, in this regard the STR and TR shares are again more than 90.0 percent and RIR is in between 10.0 to 5.0 percent only. Coming to the OGR and CAGR of crushed cane during the period of study is 44.0 & 0.62, 1270.0 & 19.0, -51.0 & -0.73 and 49.0 & 0.70 percent at national level, RIR, TR and STR respectively. The consumption shares of sugarcane in between Sugar and Jaggary including Khandasari not similar, in the initial level to up to 1990 decades a significant share of sugarcane utilized for Jaggary and Khandasari after the 1990 decades sugar as replaced the in the both regions of STR and TR, but in the RIR Jaggary and Khandasari not having the remarkable changes, in this region more than 80.0 percent of sugarcane utilizing for the making of jaggary and Khandasari. Sugar policy must be benefited farming community of sugarcane. There is large scope to extend the sugarcane area and factories in Estrn and western Indian states, in future we will get the environmental sustainability there is a need to improve the area, production, productivity, sugar factories and cottage industries in all over the states. To encourage the sugar sector and manufacturing of sugar and Jaggary, forming community-based policies are needed and these policies have to flexible according the local requirement. All the suggestion when we adopted India will get the Atmanirbhar, Suvruddi and Vikasith Barath by 2047 as in the Centenary celebrations.

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