CHAPTER - IV

SIZE, LOCATION
AND
RAW MATERIALS
Introduction

The chapter titled 'Size, Location and Raw Material' is designed to critically analyse these factors with a view to understand the economics and feasibility of location. Though there are various aspects of analyzing the performance of co-operative sector of the sugar industry, the factors like size, location, and raw material potentials cannot be ignored particularly in sugar industry because it is agro-based that directly contributes to the making of profit or loss. The cost of production, capacity utilization, juice recovery, cane crushed and other activities have direct bearing on the performance of a sugar industry. A good beginning point for such an analysis is the examination of size, location and raw material potential.

Such a detailed examination of various issues external to the operations may point to the causes behind the performance. So we propose in this chapter to examine areas like raw material potential, cane area contracted, economics of scale etc.
Raw Material

As per Hindu Mythology, the first reference about sugarcane was made in ‘Rudra Tamila Samhita,’ indicating that sugarcane cultivation has originated in our country.

Sugarcane is the principal raw material for the sugar factories to manufacture crystal sugar. The availability of adequate quantity and quality of sugarcane at reasonable price and on time is a problem of vital importance. Cane is a perishable raw material because it starts deteriorating with the passage of time converting sucrose into invert sugar which cannot be crystallized. So the movement of sugarcane and the role of different means of transport and good roads in factory zones etc., are considerable important calling for more urgent attention.

Cane Varieties

The sugarcane cultivation forms the basis for the manufacture of sugar, khandsari and gur. As such many varieties of sugarcane were found in Indian sugarcane cultivation. The sugarcane varieties in India were:

1. Marities cane
2. Otaheite cane
3. Bourbone cane,
4. Batavian cane,
5. China cane,
6. Singapore cane, and
7. Indian cane.

Sugar factory's viability is dependent on sugar recovered per unit of cane crushed. Hence in the area available for sugarcane plantation in a factory zone, varieties with higher percentage of sugar are recommended for planting. An ideal ratio of Early Maturing, Mid-Late and Late Varieties as recommended by research institute is 40:30:30. Early marketing varieties mature in 9-10 months, mid late varieties in 10-11 months and late varieties in 11-12 months.

In different factory zones, depending on climatic factors and soil nature, different varieties of sugarcane are cultivated. Most of the varieties in India have originated from research institute, Coimbatore. This is the reason why, the cane is identified as 'co' variety.

The varieties recommended are as follows:

1. Early: CoT8201; Co8014; CoA89085; Co8021; Co6907; 85A261.
2. Mid Late: Co7805; Co7219; Co87040 & Co7706.
3. Red Rot Tolerant: CoT8201; CoA89085; Co7706 & Co7805.
4. Saline Alkali Tolerant: Co8021; CoA89081 & 81A99.
5. Scale Tolerant: Co8014.
6. Moisture Stress Areas: Co7219; Co6907; CoT8201; Co62175.
7. Water Stagnated Areas: Co6907; CoT8201.

8. Improved Varieties: 88A162; 87A380; 87A397; 90A272; 83V15.

These varieties of cane is grown in factory zones in the State.

The varieties recommended for crushing in different periods of the crushing season are detailed in the following table.

**TABLE 4.01**

PERIOD OF CRUSHING NOVEMBER TO APRIL/MAY

<table>
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<tr>
<th>Opening mill cane varieties</th>
<th>Middle part of the crushing season i.e., January 15th to end February</th>
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Planting Periods

Sugarcane is an annual crop which is cultivated in the fields for about 12-14 months. There are two types of crops. However, in certain parts, the period extends further to a total of 18 months. The short duration varieties of the sugarcane take about 8 months.

In the State there are three main planting periods such as:

Autumn  (September-October planting)
Spring   (February-March planting)
Summer  (April-May planting)

The harvesting of crop is done during October to April, which is the peak crushing period for sugar factories.

In the State harvesting is mostly done manually whereas in advanced countries there is an arrangement for mechanical harvesting.

One of the main features of the co-operative sugar sector is that the member sugarcane growers and their families are directly involved in various socio-economic activities going in and around the factories. In this way thousands of sugarcane growers and their families are associated with the co-operative sugar sector directly or indirectly.
Adsali and Eksali

When the duration of cane crop from planting to harvesting covers a period of 18 months, it is called Adsali crop. The adsali planting commences in July and harvesting is done from October to January of the next year.

When the sugarcane crop is one year i.e., the time gap between planting and harvesting is one year, it is known as eksali crop. Planting is done from November to April, while harvesting is done from November to April of the next year.

Khariff refers to the crops which are grown during the South West Monsoon i.e., from June to September in a calendar year.

Plant Cane and Ratoon Cane

The cane planted from fresh seed and brought to mills for crushing is known as plant cane. There is another cane known as Ratoon Cane. After harvesting, the stubble left is allowed to grow for the second time. In our country, the ratoon cane is cultivated for 1 to 3 times. There are some countries which take 10 ratoons also.

The crops which are grown during North East Monsoon i.e., from October to February are known as Rabi crops.
The cultivation of sugarcane has made enormous progress in various parts of the State in general and in Chittoor district of the State in particular. Sugarcane thrives best in tropical and sub-tropical regions also. The required geographical or ecological conditions are suitably available in the district. The sugarcane producing areas in the State may be divided into three fairly distinct economic regions namely Coastal Andhra region, Rayalaseema region and Telangana region. The sugar growing major districts of Coastal Andhra are Visakhapatnam, East Godavari, West Godavari and Krishna districts. From the point of view of climate as well as soil coastal districts are more suitable compared to the other two regions for cultivation of sugarcane as coastal belt enjoys hot and moist climate.

In Rayalaseema region Chittoor district is the major sugarcane producing area. Similarly in Telangana region, Nizamabad and Medak are the two major cane producing districts. On the whole sugarcane is grown in almost all districts except Hyderabad and insignificant quantity in Warangal district.

Cane Potential in the State

Sugarcane in the State is grown in the majority of the districts but its cultivation is highly concentrated in coastal districts. On an average
about 60 per cent of state's sugarcane comes from Coastal Andhra region. In Rayalaseema region the area under sugarcane in Chittoor district is higher than the other three districts of the region. On an average about 80 to 85 per cent of Rayalaseema's sugarcane comes from Chittoor district alone. In Telangana region Medak and Nizamabad districts cultivate larger area for growing sugarcane compared to other districts.

The data relating to cane area in co-operative sector sugar industry in Andhra Pradesh are arranged in Table 4.02.

The table shows that there are 18 sugar factories in co-operative sector.

The cane area under the jurisdiction of co-operative sugar factories in the State was 50,940 hectares in the year 1992-93. The highest percentage of cane area was under Etikoppaka Co-operative Sugar Factory accounting 8.83 per cent to total. The cane area for cultivation has been increasing from year to year indicating a slow and steady progress in bringing more area under cane cultivation. For instance the area was 54,850 hectares in the year 1996-97 showing an increase of 4,000 hectares.
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Note: Figures in parentheses indicate percentages to total.
CO-OPERATIVE SUGAR FACTORY-WISE CANE AREA

Figure 4.01
In the year 2001-02 the cane area under the jurisdiction of 18 co-operative sugar factories in the State was 61,777 hectares.

**Rayalaseema Region – A Drought Prone Region**

In drought economics the name of the Rayalaseema region is popularly known. This region covers the tract comprising of ceded or Deccan districts. Originally this region comprised of Bellary, Anantapur, Cuddapah, Kurnool and Chittoor districts. This part of the State till 1953 formed part of the then composite Madras State. Consequent on the re-organisation of States some parts of the region were transferred to neighbouring states and some parts of neighbouring states were transferred to this region.

To mention parts of Bellary and a few villages from Chittoor district were transferred to Mysore and Tamilnadu. Similarly some parts from Tamilnadu were transferred to this region. Today Rayalaseema region consists of 4 districts, namely Anantapur, Cuddapah, Kurnool and Chittoor districts. The two taluks viz., Giddalur and Markapur were originally in Kurnool district. Presently these two taluks are in the newly formed Prakasam district consequent on the carving of new district in February 1970. Historically, Rayalaseema region was once a part of the famous Vijayanagar Empire (1336 to 1749 A.D).
The Rayalaseema region is called as stalking ground of famines is a track of sparsely populated, economically vulnerable part of the State. Famines and droughts are common visits, the soil is rocky and unyielding and remain industrially backward. The region is a drought prone. Dry track, rocky soil and scanty rains are the features of this area.

But this region is endowed with rich mineral deposits, not fully exploited. The problem is one of the technological breakthrough for which huge investments have to be made. Unless breakthrough is achieved in dry farming, in the long run, the wet farming alone cannot be an economic proposition. Apparently the long run solution for the region lies in rapid industrialization and exploration of mineral resources. The poor level of resources development is due to low capital and technology.

Sample District

The Chittoor district was constituted with effect from 1st April 1911. Some taluks were transferred from the old North Arcot district of the Madras State and some taluks from old Cuddapah district. A few ex-Zamindari taluks of North Arcot district were transferred from 1st December 1928 to the Palamaner taluk of Madanapalle division. Eight villages actually enclaves of the Mysore State were transferred to the
Palamaner taluk with reference to the exchange of enclaves under the
Provinces and States (Absorption of Enclaves) Order 1950.

It may be stated that the take over of the Zamindari areas by the
Government took place under the Madras Estate (Abolition and
Conversion in the Ryotwari) Act, 1948. Accordingly, six villages of
Venkatagiri Raja were taken over on 7-9-1949 and the most of the
remaining estates in the district (Zamindari and under Tenure) were
taken over on 7th September, 1950.

Chittoor is one of the important sugarcane growing districts in
Andhra Pradesh. The soil and climatic conditions of the district are well
suited for growing sugarcane. The farmers are well versed in the art of
sugarcane cultivation and jaggery making. The establishment of a sugar
factory for better utilization of sugarcane grown in the district and to
improve the economic conditions of the peasants was felt essential.

SAMPLE UNITS

1. The Chittoor Co-operative Sugar Factory

The Chittoor co-operative Sugars Limited, Chittoor is the first
agro-based industry. It was first registered on 22.8.1955 under the
Andhra Pradesh Co-operative Society (APCS) Act. Its area of operation
comprises of 192 villages in 21 mandals. Factory is located along
Cuddalore-Kurnool National Highway No.18, 3 Km towards Kurnool from Chittoor town. It owns 85.96 acres of land. It was first commissioned on 18.1.1963 with a licenced and installed capacity of 1000 tonnes cane crushing per a day. During 1974 its cane crushing capacity has been expanded to 1600 tonnes a day. Since 1989 modernisation is being done in phases. Presently the factory is working at an average cane crushing of 1800-2000 tonnes a day.

2. Sri Venkateswara Co-operative Sugar Factory

Sri Venkateswara Co-operative Sugar Factory Ltd., Gajulamandyam was registered in the year 1972 with installed capacity of 1250 TCD and crushing was started during the year 1977-78. Subsequently the management took up modernization in the year 1994-95 with crushing capacity of 1500 TCD. The total share holders are 11,112 in the zone covering 22 mandals and 505 villages.

The plant was commissioned on 22.3.1978. The original project cost was Rs.634.00 lakhs. There was no over run the cost. The additional cost incurred is about Rs.250.00 lakhs. The authorized share capital of the society at present is Rs.6.00 crores

Presently, the society provides employment to 261 regular employees, 216 seasonal employees, 131 consolidated employees and
143 NMRs during season. The society is now classified as “A” category unit in co-operative sector by the C.Subramanyam Committee constituted by the State Government.

**Cane Area**

The figures relating to cane area under the sample unit’s jurisdiction are shown in Table 4.03.

The table shows that the total sugarcane area under cultivation in respective factory zones was 6.83 thousand hectares divided into 3.18 thousand hectares falling under Tirupati unit and 3.65 thousand hectares in case of Chittoor factory.

The area under Chittoor factory constitute 53.44 per cent to total and 46.56 per cent in case of Tirupati unit.

A negative growth rate was recorded in the year 1996-97 in respect of Tirupati unit in respect of area under cultivation. The position was similar in case of Chittoor unit. The decline in the growth rate respectively accounted (-) 34.50 and (-) 7.45 of Tirupati and Chittoor.

In the year 2001-2002 the total area under cultivation was 9.49 thousand hectares showing an increase in the area comparing to 1999-2000 but a marginal decline in the year 2000-01.
### TABLE 4.03

PROGRESS OF CANE AREA UNDER FACTORY ZONES

<table>
<thead>
<tr>
<th>Years</th>
<th>Tirupati</th>
<th>Growth Rate</th>
<th>Chittoor</th>
<th>Growth Rate</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992-93</td>
<td>3.18</td>
<td>-</td>
<td>3.65</td>
<td>-</td>
<td>6.83</td>
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<tr>
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<td>(46.56)</td>
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<td>(53.44)</td>
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</tr>
<tr>
<td>1993-94</td>
<td>3.78</td>
<td>(+) 18.87</td>
<td>5.35</td>
<td>(+) 46.58</td>
<td>9.13</td>
</tr>
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<td>(41.40)</td>
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<td>(58.60)</td>
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<td>(100)</td>
</tr>
<tr>
<td>1994-95</td>
<td>5.59</td>
<td>(+) 47.88</td>
<td>9.70</td>
<td>(+) 81.31</td>
<td>15.29</td>
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<td>(36.56)</td>
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<td>(63.44)</td>
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<tr>
<td>1995-96</td>
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<td>(-) 18.07</td>
<td>4.70</td>
<td>(-) 51.55</td>
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<td></td>
<td>(49.35)</td>
<td></td>
<td>(50.65)</td>
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<td>(100)</td>
</tr>
<tr>
<td>1996-97</td>
<td>3.00</td>
<td>(-) 34.50</td>
<td>4.35</td>
<td>(-) 7.45</td>
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<td>(59.18)</td>
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<td>(-) 11.67</td>
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<td>(+) 21.84</td>
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<td>(66.67)</td>
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<td>(100)</td>
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<tr>
<td>1998-99</td>
<td>3.95</td>
<td>(+) 49.06</td>
<td>5.19</td>
<td>(-) 2.08</td>
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<td>(43.22)</td>
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<td>(56.78)</td>
<td></td>
<td>(100)</td>
</tr>
<tr>
<td>1999-2000</td>
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<td>(-) 22.78</td>
<td>5.70</td>
<td>(+) 9.83</td>
<td>8.75</td>
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<td>(34.86)</td>
<td></td>
<td>(65.14)</td>
<td></td>
<td>(100)</td>
</tr>
<tr>
<td>2000-2001</td>
<td>4.55</td>
<td>(+) 49.18</td>
<td>5.09</td>
<td>(-) 10.70</td>
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</tr>
<tr>
<td></td>
<td>(47.20)</td>
<td></td>
<td>(52.80)</td>
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<tr>
<td>2001-2002</td>
<td>4.55</td>
<td>0</td>
<td>4.94</td>
<td>(-) 2.95</td>
<td>9.49</td>
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<td>(47.95)</td>
<td></td>
<td>(52.05)</td>
<td></td>
<td>(100)</td>
</tr>
</tbody>
</table>

Note: Figures in parentheses indicate percentages to total.
Source: Review on the performance of Sugar Factories in Andhra Pradesh, various issues.
Figure 4.02

CANE AREA UNDER FACTORY ZONES

(in 1000 hectares)

Years


Years

Total
Chittoor
Tirupati
The year-wise trend along with growth rate can be seen from the table.

The following are the values of co-efficient of variation.

<table>
<thead>
<tr>
<th></th>
<th>Tirupati</th>
<th>Chittoor</th>
</tr>
</thead>
<tbody>
<tr>
<td>C.V.</td>
<td>22.62</td>
<td>28.52</td>
</tr>
<tr>
<td>S.D.</td>
<td>0.88</td>
<td>1.52</td>
</tr>
</tbody>
</table>

Since the co-efficient of variance is greater for Chittoor unit, it indicates greater variability in the area of cane cultivation in terms of hectares under the jurisdiction of Chittoor Co-operative Sugar Factory. The co-efficient of variance is much less by nearly 6 in case of Tirupati co-operative sugar factory.

**Null Hypothesis (Ho)**

Let us take the hypothesis that there is no significant variance between the samples.

Applying F-test

\[
F \text{ Cal. Value } 3.01
\]

\[
F \text{ Tab. Value } 3.19
\]

F calculated value is much less than the tabulated value.

Accept the null hypothesis if F Cal. Value is less than F Tab.value.
Since the calculated value of $F$ is much less than the tabulated value of $F$, it is not significant.

Hence $H_0$ may be accepted and we further infer that the two samples have been drawn from the same population.

Cane Area Reservation

There is a system of cane area reservation for each factory zone. Under this system all the cane growers falling under the jurisdiction of the reserved area of the factory are required to supply cane to the specified factory falling under the reserved area and the mill is obliged to crush all the cane supplied by the growers.

The reservation of cane area is necessary otherwise it will be difficult for the sugar factories to manage the supply. In the absence of this system it may result in inadequate sugarcane availability in some areas and surplus supply in some other areas. The problems of long waiting, distance transportation, high cost as well as low recovery are also some other associated problems.

Cane Agreement

When the sugarcane is offered by a cane grower or a cane growers' co-operative society to a sugar factory and the sugar factory
has accepted such an offer and entered into an agreement, the cane estimated for sale as per the agreement is known as contracted cane.

The offer and acceptances are regulated by A.P.Sugarcane (Regulation of Supply and Purchase) Rules, 1961. As per the Rule 20(2) of the said order, a cane grower or a cane grower co-operative society may within 14 days of issuance of an order declaring an area as factory zone offer in form ‘2’ to supply cane grown in that area to the occupier of the factory.

The occupier of the factory for which a zone has been declared shall within 14 days of the receipt of the offer enter into an agreement in form 3 or 4 for the purchase of cane offered.

Cane Area Contracted

Accordingly the total cane area contracted by the two sample units was 8.04 thousand hectares in the year 1991-92 of which 57.84 per cent area to total was contracted by the Chittoor mill and Tirupati factory accounted for 42.16 per cent to total. The next year there was a slight decline in area contracted. During the period under observation the year 1994-95 recorded highest cane area contract accounting 15.1 thousand hectares. It fell down to 10.11 thousand hectares in the following year. In the remaining five years the extent of cane area
### TABLE 4.04
TREND OF CANE AREA CONTRACTED BY FACTORIES
(in '000 hectares)

<table>
<thead>
<tr>
<th>Years</th>
<th>Tirupati</th>
<th>Growth Rate</th>
<th>Chittoor</th>
<th>Growth Rate</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(in %)</td>
<td></td>
<td>(in %)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(42.16)</td>
<td></td>
<td>(57.84)</td>
<td></td>
<td>(100)</td>
</tr>
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<td></td>
<td>(40.67)</td>
<td></td>
<td>(59.33)</td>
<td></td>
<td>(100)</td>
</tr>
<tr>
<td>1993-94</td>
<td>3.78</td>
<td>(+) 30.34</td>
<td>5.25</td>
<td>(+) 24.11</td>
<td>9.03</td>
</tr>
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<td>(41.86)</td>
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<td>(58.14)</td>
<td></td>
<td>(100)</td>
</tr>
<tr>
<td>1994-95</td>
<td>5.59</td>
<td>(+) 47.88</td>
<td>9.51</td>
<td>(+) 81.14</td>
<td>15.10</td>
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<td>(37.02)</td>
<td></td>
<td>(62.98)</td>
<td></td>
<td>(100)</td>
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<td>1995-96</td>
<td>4.58</td>
<td>(-) 18.07</td>
<td>5.33</td>
<td>(-) 41.85</td>
<td>10.11</td>
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<td></td>
<td>(54.70)</td>
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<td>(100)</td>
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<td>1996-97</td>
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<td>(37.41)</td>
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<td>(62.59)</td>
<td></td>
<td>(100)</td>
</tr>
<tr>
<td>1997-98</td>
<td>3.97</td>
<td>(+) 32.33</td>
<td>4.50</td>
<td>(-) 10.36</td>
<td>8.47</td>
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<td>(46.87)</td>
<td></td>
<td>(53.13)</td>
<td></td>
<td>(100)</td>
</tr>
<tr>
<td>1998-99</td>
<td>3.90</td>
<td>(-) 1.76</td>
<td>4.38</td>
<td>(-) 2.67</td>
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<tr>
<td></td>
<td>(47.10)</td>
<td></td>
<td>(52.90)</td>
<td></td>
<td>(100)</td>
</tr>
<tr>
<td>1999-2000</td>
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<td>(-) 7.18</td>
<td>4.63</td>
<td>(+) 5.71</td>
<td>8.25</td>
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<td>(56.12)</td>
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</tr>
<tr>
<td>2000-2001</td>
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<td>(+) 5.80</td>
<td>4.5</td>
<td>(-) 2.81</td>
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<td></td>
<td>(45.98)</td>
<td></td>
<td>(54.02)</td>
<td></td>
<td>(100)</td>
</tr>
</tbody>
</table>

Note: Figures in parentheses indicate percentages to total.
Source: Review on the performance of Sugar Factories in Andhra Pradesh, various issues.
TRENDS OF CANE AREA CONTRACTED BY FACTORIES (in '000 hectares)

Figure 4.03
contracted remained constant ranging between 8.02 thousand hectares and 8.47 thousand hectares.

Factory-wise and year-wise growth rates and figures relating to cane area contracted are shown in Table 4.04.

**ANOVA**

F test is applied with the following hypothesis in order to know whether there is any difference between samples and that the two samples have been drawn from the same population.

Let us take the hypothesis that there is no significant variance between samples.

Applying F test,

\[ F_{cal. \ Value} = 4.00 \]

\[ F_{Tab. \ Value} = 3.19 \]

F calculated value is more than the table value.

Accept the null hypothesis if cal. Value is less than F tab. Value.

Since the calculated value of F is more than tabulated value at 5 per cent level of significance, so the variance is significant.

Hence Ho is rejected and we further infer that the two samples have significant variance.
Measuring Dispersion and Variance

The calculated values of standard deviation and co-efficient of variations of two samples are as follows:

<table>
<thead>
<tr>
<th></th>
<th>S.D.</th>
<th>C.V.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tirupati</td>
<td>0.74</td>
<td>19.17</td>
</tr>
<tr>
<td>Chittoor</td>
<td>1.48</td>
<td>28.35</td>
</tr>
</tbody>
</table>

Co-efficient of variation is greater in respect of Chittoor factory.

Cane Quantity Contracted

Under this paragraph it is proposed to analyse the trend of sample unit-wise cane quantity contracted for crushing purpose.

Table 4.05 shows sugar season-wise particulars and extent of quantity of cane contracted.

During the period under observation the sugar year 1994-95 recorded highest quantity of cane contract made by the sample units. The quantity contracted was 10.51 lakh metric tonnes. In all other years the cane quantity contracted varies between 4.48 lakh metric tonnes in the year 1992-93 and 5.64 lakh metric tonnes in the year 1996-97.

The main reason for contracting more cane quantity was due to higher statutory minimum cane price as well as State advised cane price
TABLE 4.05

TREND OF FACTORY-WISE CANE QUANTITY CONTRACTED

<table>
<thead>
<tr>
<th>Years</th>
<th>Tirupati</th>
<th>Growth Rate</th>
<th>Chittoor</th>
<th>Growth Rate</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>1991-92</td>
<td>1.96</td>
<td>-</td>
<td>2.93</td>
<td>-</td>
<td>4.89</td>
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<td>(40.18)</td>
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<td>(59.92)</td>
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<td>(100)</td>
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<td>1992-93</td>
<td>1.64</td>
<td>(-) 16.32</td>
<td>2.84</td>
<td>(-) 3.07</td>
<td>4.48</td>
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<td></td>
<td>(36.61)</td>
<td></td>
<td>(63.39)</td>
<td></td>
<td>(100)</td>
</tr>
<tr>
<td>1993-94</td>
<td>2.46</td>
<td>(+) 50.00</td>
<td>2.72</td>
<td>(-) 4.23</td>
<td>5.18</td>
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<td>(47.49)</td>
<td></td>
<td>(52.51)</td>
<td></td>
<td>(100)</td>
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<tr>
<td>1994-95</td>
<td>3.84</td>
<td>(+) 56.10</td>
<td>6.67</td>
<td>(+) 145.22</td>
<td>10.51</td>
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<td>(63.46)</td>
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<td>(100)</td>
</tr>
<tr>
<td>1995-96</td>
<td>2.58</td>
<td>(-) 32.81</td>
<td>2.97</td>
<td>(-) 55.47</td>
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<td></td>
<td>(100)</td>
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<td>1996-97</td>
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<td>1997-98</td>
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<td>(+) 10.92</td>
<td>3.02</td>
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<td>(54.32)</td>
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<tr>
<td>1998-99</td>
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<td>(-) 11.81</td>
<td>2.91</td>
<td>(-) 3.64</td>
<td>5.15</td>
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<tr>
<td>1999-2000</td>
<td>2.36</td>
<td>(+) 5.36</td>
<td>3.09</td>
<td>(+) 6.19</td>
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<td>(43.30)</td>
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<td>(56.70)</td>
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<tr>
<td>2000-2001</td>
<td>2.38</td>
<td>(+) 0.85</td>
<td>3.01</td>
<td>(-) 2.59</td>
<td>5.39</td>
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<tr>
<td></td>
<td>(44.16)</td>
<td></td>
<td>(55.84)</td>
<td></td>
<td>(100)</td>
</tr>
</tbody>
</table>

Note: Figures in parentheses indicate percentages to total.
Source: Review on the performance of Sugar Factories in Andhra Pradesh, various issues.
TREND OF FACTORY-WISE CANE QUANTITY CONTRACTED (in lakh MTs)

Figure 4.04
comparing to prices of earlier years. The higher state advised price attracted the cane growers to grow more cane to take advantage of higher cane price.

In the year 2000-01 the total cane quantity contracted was 5.39 lakh metric tonnes divided into 2.38 lakh metric tonnes contracted by the Tirupati unit representing 44.16 per cent to total and 3.01 lakh metric tonnes of cane contracted by the Chittoor unit constituting 55.84 per cent to total.

**Standard Deviation and Co-efficient of Variation**

To study the dispersion the standard deviation technique is used. Similarly to know the variability of the two samples, the measure of coefficient of variation is used to know the behaviour of cane quantity contracted.

The results are as follows:

<table>
<thead>
<tr>
<th></th>
<th>Tirupati</th>
<th>Chittoor</th>
</tr>
</thead>
<tbody>
<tr>
<td>S.D.</td>
<td>0.54</td>
<td>1.12</td>
</tr>
<tr>
<td>C.V.</td>
<td>22.22</td>
<td>33.43</td>
</tr>
</tbody>
</table>

The value of dispersion in case of Chittoor unit is greater. It means the greater is the standard deviation. It may be inferred that the greater will be the magnitude of the deviations of the values. The
Tirupati unit recorded small standard deviation showing high degree of uniformity.

The co-efficient of variation is greater in case of Chittoor unit indicating less consistent.

**Testing Significance**

**Null Hypothesis (Ho)**

We set up the null hypothesis that the two samples have the same variance, that the data are independent. In other words the null hypothesis is that there is no significant variance between the two variables and the two samples have been drawn from the same population.

Accordingly,

\[ F \text{ Cal. Value} = 4.21 \]
\[ F \text{ Tab. Value} = 3.19 \]

F Cal. Value > F Tab. Value.

Accept the null hypothesis if F cal. Value is less than F tab value.

Since the F cal. Value is more than F Tab. Value. Hence it is significant. So Ho may be rejected at 5 per cent level of significance.
Cane Production

The performance of sugar factories in respect of cane crush, juice recovery and sugar production would depend to a great extent upon the availability of cane of required quality and quantity.

The total quantity of cane produced by the grower members under the two sample factory zones was 5.12 lakh metric tonnes in 1991-92 divided into 2.32 lakh metric tonnes under Tirupati factory zone and 2.80 lakh metric tonnes under Chittoor factory zone. They respectively constitute 45.31 per cent and 54.69 per cent total.

The quantity of cane production fell down to 4.77 lakh metric tonnes in 1992-93 and further raised to 6.06 lakh metric tonnes in the year 1993-94 and further to 10.59 lakh metric tonnes in the year 1994-95.

During the second part of the period under observation the cane production was almost constant ranging between 5.12 lakh metric tonnes and 5.78 lakh metric tonnes.

Table 4.06 shows growth rates, year-wise and factory-wise cane production under the sample factory zones.
<table>
<thead>
<tr>
<th>Years</th>
<th>Tirupati</th>
<th>Growth Rate</th>
<th>Chittoor</th>
<th>Growth Rate</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991-92</td>
<td>2.32</td>
<td>-</td>
<td>2.80</td>
<td>-</td>
<td>5.12</td>
</tr>
<tr>
<td></td>
<td>(45.31)</td>
<td></td>
<td>(54.69)</td>
<td></td>
<td>(100)</td>
</tr>
<tr>
<td>1992-93</td>
<td>1.80</td>
<td>(-) 22.41</td>
<td>2.97</td>
<td>(+) 6.07</td>
<td>4.77</td>
</tr>
<tr>
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<td>(37.74)</td>
<td></td>
<td>(62.26)</td>
<td></td>
<td>(100)</td>
</tr>
<tr>
<td>1993-94</td>
<td>2.46</td>
<td>(+) 36.67</td>
<td>3.60</td>
<td>(+) 21.21</td>
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<td>(40.59)</td>
<td></td>
<td>(59.41)</td>
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<td>(100)</td>
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<tr>
<td>1994-95</td>
<td>3.84</td>
<td>(+) 56.10</td>
<td>6.75</td>
<td>(+) 87.50</td>
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<td>(63.74)</td>
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<td>(100)</td>
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<tr>
<td>1995-96</td>
<td>2.69</td>
<td>(-) 29.95</td>
<td>2.50</td>
<td>(-) 62.96</td>
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<td>1996-97</td>
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<td>(-) 2.27</td>
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<td>1997-98</td>
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<td>(100)</td>
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<tr>
<td>1998-99</td>
<td>2.36</td>
<td>(+) 45.68</td>
<td>3.42</td>
<td>(-) 2.29</td>
<td>5.78</td>
</tr>
<tr>
<td></td>
<td>(40.83)</td>
<td></td>
<td>(59.17)</td>
<td></td>
<td>(100)</td>
</tr>
<tr>
<td>1999-2000</td>
<td>2.11</td>
<td>(-) 10.59</td>
<td>3.31</td>
<td>(-) 3.22</td>
<td>5.42</td>
</tr>
<tr>
<td></td>
<td>(38.92)</td>
<td></td>
<td>(61.07)</td>
<td></td>
<td>(100)</td>
</tr>
<tr>
<td>2000-2001</td>
<td>2.03</td>
<td>(-) 3.79</td>
<td>3.41</td>
<td>(+) 3.02</td>
<td>5.44</td>
</tr>
<tr>
<td></td>
<td>(37.32)</td>
<td></td>
<td>(62.68)</td>
<td></td>
<td>(100)</td>
</tr>
</tbody>
</table>

Note: Figures in parentheses indicate percentages to total.
Source: Review on the performance of Sugar Factories in Andhra Pradesh, various issues.
F test

We set up the null hypothesis that there is no significant variance between samples.

Applying F test,

\[ F_{Cal. \ Value} = 3.78 \]
\[ F_{Tab. \ Value} = 3.19 \]

F calculated value is more than tabulated value.

Accept the null hypothesis if F Cal.value is less than F tab. Value.

Since the calculated value of F is more than the tabulated value of F at 5 per cent level of significance, hence the variance is significant.

Hence Ho may be rejecting

<table>
<thead>
<tr>
<th>S.D.</th>
<th>C.V.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tirupati</td>
<td>0.58</td>
</tr>
<tr>
<td>Chittoor</td>
<td>1.12</td>
</tr>
</tbody>
</table>

Supply of Cane by Members

Every supply member of the co-operative sugar factories is bound to grow sugarcane every year for supply to the society. Generally the bye-laws of the society prescribes the quantity of cane in terms of tonnes of cane per share value held by the member in the society. For instance the sample Chittoor Co-operative Sugar Mill prescribed that every
supply member has to necessarily grow sugarcane at 8 tonnes of cane per each share of the value of Rs.100 held by him in the society. Similarly, the Tirupati Co-operative Sugar Mill stipulated a condition that every member has to grow sugarcane and supply to the society at 10 tonnes of cane per each share of the value of Rs.100.

In addition to this limit and having regard to the anticipated requirements of the cane for the factory, the management of the society determines for each ensuing season in advance the rate of tonnage of cane to be supplied by each member for each share held by him. Accordingly, the members invariably have to enter into an agreement for such a supply. So the members have to supply accordingly and on dates specified by the society.

The cane growers of the respective sugar factory zones may enter into contract with factories for the hectarage for cultivation of sugarcane or quantity of the cane. According to the terms of the contract the grower members are required to supply the agreed quantity of the cane grown. Thus every agreed grower is bound to grow cane every year for supply to the factories. In the case of co-operative sugar societies the bye-laws also may provide penal provisions for the violation of cane supply terms.
Cane Cultivation Programme

The society will have the power to formulate a programme of sugarcane cultivation, within the area of operation of the society. Towards this the society gives appropriate instructions to the cane grower member by taking into consideration the crushing requirements. Therefore, every member has to carry out the instructions issued by the society in respect of every matter concerned with his production of sugarcane, such as the maximum acreage he may keep under cane, having regard to the acreage of lands held by him and his resources, irrigation, quality and extent of manuring, crop protection etc.

Duration in a co-operative sugar factory refers to the number of days from the start of a season to closure of a season. The ‘gross season days’ of the season represents actual hours of operation from the time of starting to the time of closure of season including the time spent on stoppages divided by 24.

The ‘net season days’ represent the actual working hours during which crushing takes place, excluding the time spent on stoppages, divided by 24.
Penalty for Default in Supply

The bye-laws of the societies prescribed penalty for default in supply of cane agreed to be supplied. Any cane grower member failing to supply sugarcane accordingly without valid reasons the society will take an appropriate action against him in addition to penalty. For instance the bye-laws of the Chittoor Co-operative Sugar Society prescribed a fine at the rate of Rs.5 for each metric tonne of sugarcane not supplied by him for the first default, at Rs.10 for the second default and at Rs.20 for the third default.

In addition to the above if any member commits a default the fourth time he will be converted as non-supply member. The amount of fine imposed is recoverable as debt due to the society from the cane bill. The members who are defaulters are not eligible to stand for election or to continue to be a member of the board.

Similarly the Tirupati Co-operative Sugar Society has been regulating supply of cane on similar lines.

Outright Procurement

The society procures outright the sugarcane delivered to the factory by the supply member in accordance with the permits issued by
the society at a price not less than the statutory minimum price fixed by
the Government. The society has the every right to refuse the delivery of
bad quality cane such as water shoots, tops dead cane, half burnt cane
etc. The members necessarily have to replace such cane by cane
acceptable to the factory.

Purchase of Higher Quota than Agreed

The society can purchase cane of higher quota than agreement
cane. If at any time, it is found that sugarcane supplied by the members
as per agreement is not sufficient to work the machinery to full capacity
the society may buy the deficit quantity firstly from the members. In this
preference is being given to loyal members in the issue of additional
quota. If still there is deficit supply, such requirements may be procured
from the outsiders.

Cane Price

Like sugar price policy, sugarcane price policy is one which
determines the cultivation of land for cane and supply of cane to the
factories. Fixing of statutory price for sugarcane originally started from
the season 1934-35 under Sugarcane Act 1934. In this connection Bihar
and U.P. Governments are worth mentioning who started fixing the
statutory price in 1934-35. The principles and methods adopted by the
Central Government and State Governments in fixing minimum cane prices are:

1. Linking cane price to existing sugar price.
2. Fixing minimum price, unrelated to sugar price for the whole or part of the season.
3. Fixing consolidated price related to percentages of sugar recovery.
4. Linking cane price to extra realization from the sale of sugar.

In fixing minimum sugarcane price the prevailing prices are the ten highest quotations of the sugar factories. For the first grade sugar the sugarcane price is announced every fortnight.

Other State Governments followed announcing fixing minimum price for sugarcane at the end of 1950s. But different states adopted different principles and methods for fixing cane price. So from 1935 to 1950 there had been no fixed policy which was uniform in its implementation. Consequently the Government of India interfered and began to fix price for sugarcane.

From the year 1950-51 the Central Government decided to have uniform sugarcane price policy and began to fix an All India Minimum Price for Sugarcane. This ensured consistency or uniformity in the
sugarcane price throughout the country. The passing of the sugarcane control order in 1950 enabled the Central Government to fix an all India minimum cane price.

The factors considered for fixing the cane price were:

1. Recovery of juice from sugarcane.
2. Cost of production of sugarcane.
3. The price at which sugar is sold by the producers.
4. Availability of sugar to the consumers at a fair price.
5. The general trend of prices of agricultural commodities.
6. Returns to the cane growers from alternative crops.

The basic principle in any price fixation is that it must cover the cost of cultivation. The statutory minimum cane price should basically cover the cost.

Level of sugar recovery is also an important factor. Both the Sen Commission and the Bhargava Commission have recommended to reduce the recovery level of sugar, so as to cover lowest level of recovery at regional level. The Bhargava Committee recommended 8.5 per cent recovery. The agricultural Price Commission recommended at least 9 per cent. Quality of cane decides the price for this purpose. Under this the payment to every individual cane grower should correspond to the quality of the cane produced. Accordingly, the price for cane is to be determined on the basis of quality formula. The main
elements in the quality formula according to Sugar Industry Enquiry Commission are as follows:

a) A minimum cane price
b) A basic level of sugar recovery
c) A premium for every 0.1 per cent increase in sugar recovery over the basic level, and
d) The average sugar recovery of the factory during a fixed period.

Thus the Government has been fixing each year the first three elements in the formula. However, these are subject to changes from year to year.

The Commission of Agricultural Costs and Prices (CACP):

The Agricultural Price Commission (APC)

The Agricultural Price Commission was set up by the Government of India in 1965 to advise the Government on the price policy for agricultural commodities including sugarcane with a view to evolve a balanced and integrated price structure in the perspective of the overall needs of the economy and with due regard to the interests of the producer and consumer.

The Agricultural Price Commission submits report every year keeping in view the above objectives. Its findings, however, are only recommendatory and the Central Government finally decides the price
of cane taking into consideration the interests of all the parties concerned and taking an overall picture of the country as a whole.

The APC has been now renamed as the Commission of Agricultural Costs and Prices.

Statutory Minimum Price (SMP)

The Commission for Agricultural Costs and Prices every year calculates the cost of cultivation of sugarcane. It also carries out the exercise relating to the general price trend of agricultural commodities etc. The task of the commission in this regard is to make recommendations to the Government of India, regarding the statutory minimum price of sugarcane for the next season and to announce in advance.

The significance of the statutory minimum price is for calculating the levy price of sugar for public distribution. The price has got importance from the view point of the farmers. The statutory minimum price protects the interest of the farmers so that the farmers can continue to cultivate sugarcane. Thus SMP is only a National price and the factories can pay higher price.

The current season’s price as recommended by the Commission of Agricultural Costs and Prices (CACP) reflects a small increase in the
The Government of India announces the Statutory Minimum Cane Price (SMP) for every year. The price is used for calculating the levy sugar prices.

Table 4.07 shows the minimum statutory price fixed for sugarcane per quintal.

The table shows a steady increase in minimum statutory price per quintal over the years. For instance it was Rs.13 per quintal in the year 1982-83, Rs.17 per quintal in 1986-87, Rs.26 per quintal in 1991-92, Rs.42.50 per quintal in 1995-96 and it was hiked to Rs.62.05 per quintal in 2001-02.

The price is linked to basic juice recovery of 8.5 per cent.
<table>
<thead>
<tr>
<th>Year</th>
<th>Minimum Statutory Price (Rs. per qtl.)</th>
<th>Linked to basic recovery (%)</th>
<th>Premium on every 0.1% increase in recovery (Rs. per qtl.)</th>
<th>Range of minimum cane price on the basis of Col.1, 2 &amp; 3 (Rs. per qtl.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980-81</td>
<td>13.00</td>
<td>8.5</td>
<td>0.152941</td>
<td>13.00 to 18.35</td>
</tr>
<tr>
<td>1981-82</td>
<td>13.00</td>
<td>8.5</td>
<td>0.152941</td>
<td>13.00 to 18.81</td>
</tr>
<tr>
<td>1982-83</td>
<td>13.00</td>
<td>8.5</td>
<td>0.152941</td>
<td>13.00 to 19.12</td>
</tr>
<tr>
<td>1983-84</td>
<td>13.50</td>
<td>8.5</td>
<td>0.158824</td>
<td>13.50 to 19.69</td>
</tr>
<tr>
<td>1984-85</td>
<td>14.00</td>
<td>8.5</td>
<td>0.164706</td>
<td>14.00 to 20.42</td>
</tr>
<tr>
<td>1985-86</td>
<td>16.50</td>
<td>8.5</td>
<td>0.19412</td>
<td>16.50 to 24.07</td>
</tr>
<tr>
<td>1986-87</td>
<td>17.00</td>
<td>8.5</td>
<td>0.20</td>
<td>17.00 to 25.00</td>
</tr>
<tr>
<td>1987-88</td>
<td>18.50</td>
<td>8.5</td>
<td>0.21765</td>
<td>18.50 to 26.77</td>
</tr>
<tr>
<td>1988-89</td>
<td>19.50</td>
<td>8.5</td>
<td>0.2294</td>
<td>19.50 to 27.99</td>
</tr>
<tr>
<td>1989-90</td>
<td>22.00</td>
<td>8.5</td>
<td>0.2588</td>
<td>22.00 to 32.09</td>
</tr>
<tr>
<td>1990-91</td>
<td>23.00</td>
<td>8.5</td>
<td>0.270588</td>
<td>23.00 to 34.66</td>
</tr>
<tr>
<td>1991-92</td>
<td>26.00</td>
<td>8.5</td>
<td>0.305882</td>
<td>26.00 to 38.54</td>
</tr>
<tr>
<td>1992-93</td>
<td>31.00</td>
<td>8.5</td>
<td>0.364706</td>
<td>31.00 to 47.41</td>
</tr>
<tr>
<td>1993-94</td>
<td>34.50</td>
<td>8.5</td>
<td>0.405882</td>
<td>34.50 to 53.17</td>
</tr>
<tr>
<td>1994-95</td>
<td>39.10</td>
<td>8.5</td>
<td>0.46 upto 10% 0.60 above 10%</td>
<td>39.10 to 66.40</td>
</tr>
<tr>
<td>1995-96</td>
<td>42.50</td>
<td>8.5</td>
<td>0.54</td>
<td>42.50 to 68.96</td>
</tr>
<tr>
<td>1996-97</td>
<td>45.90</td>
<td>8.5</td>
<td>0.57</td>
<td>45.90 to 72.69</td>
</tr>
<tr>
<td>1997-98</td>
<td>48.45</td>
<td>8.5</td>
<td>0.60</td>
<td>48.45 to 79.05</td>
</tr>
<tr>
<td>1998-99</td>
<td>52.70</td>
<td>8.5</td>
<td>0.62</td>
<td>52.70 to 83.08</td>
</tr>
<tr>
<td>1999-2000</td>
<td>56.10</td>
<td>8.5</td>
<td>0.66</td>
<td>56.10 to 85.80</td>
</tr>
<tr>
<td>2000-2001</td>
<td>59.50</td>
<td>8.5</td>
<td>0.70</td>
<td>59.50 to 96.60</td>
</tr>
<tr>
<td>2001-2002</td>
<td>62.05</td>
<td>8.5</td>
<td>0.73</td>
<td>62.05 to 100.74</td>
</tr>
</tbody>
</table>

The statutory minimum price for sugarcane is related to a basic recovery of 8.5 per cent with a premium for every 0.1 per cent increase in recovery on a proportionality basis, which is fixed by the Central Government.

Accordingly the premium was Rs.0.20 in 1986-87, Rs.0.36 in 1992-93, Rs.0.60 in 1997-98 and it was further hiked to Rs.0.73 in 2001-02.

Figures are also calculated and arranged in the table 4.06 indicating the range of minimum cane price on the basis of minimum statutory price per quintal linked to basic recovery of 8.5 per cent and premium on every 0.1 per cent increase in recovery.

On this basis the range of minimum cane price was Rs.13.00 to Rs.18.35 per quintal 1980-81, Rs.23.00 to Rs.34.66 per quintal in 1990-91 and the range further went up to Rs.62.05 to Rs.100.74 per quintal in 2001-02.

Thus the recovery of juice from sugarcane is the basic factor to get higher premium on every 0.1 per cent increase in recovery.

The minimum cane price fixed by the Central Government also varies based on local conditions of cultivation and other cost factors. For
instance for the year 2000-01 the minimum cane price was ranging between Rs.62.30 to Rs.83.30 per quintal in Andhra Pradesh while it ranged between Rs.59.50 to Rs.96.60 per quintal in Maharashtra linked to 8.5 per cent recovery.

State-wise ranges of minimum cane price fixed by the Central Government during the last two years are shown in Table 4.08 so as to enable us to understand the variations in minimum price in various states.

The table also shows the state advised price paid in different states.

State Advised Price

The concept of State Advised Price (SAP) came into existence in early 1970s. It means it is the State Government which ‘advises’ the factories to pay a price for cane growers over and above the statutory minimum price. Hence the price is called State Advised Price. This price is to be viewed as a ‘mark-up’ over the statutory minimum price.

Alternatively, this price reflects the power of the sugarcane growers lobby in any region. Every year statutory minimum price is being announced by the Government of India for sugarcane. It is a floor price which the sugar factories are required to pay. In the case of state
### TABLE 4.08

**STATE-WISE SMP AND SAP**

(in Rupees)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Andhra Pradesh</td>
<td>56.10 to 75.90</td>
<td>62.30 to 83.30</td>
<td>62.40 to 81.50</td>
<td>67.90 to 88.10</td>
</tr>
<tr>
<td>2</td>
<td>Bihar</td>
<td>56.10 to 59.40</td>
<td>60.20 to 65.80</td>
<td>77.50 to 82.50</td>
<td>81.00 to 86.00</td>
</tr>
<tr>
<td>3</td>
<td>Gujarat</td>
<td>56.10 to 76.56</td>
<td>64.40 to 81.90</td>
<td>80.00*</td>
<td>65.00 to 85.50</td>
</tr>
<tr>
<td>4</td>
<td>Haryana</td>
<td>56.10 to 61.38</td>
<td>59.50 to 68.60</td>
<td>104.00 to 110.00</td>
<td>104.00 to 110.00</td>
</tr>
<tr>
<td>5</td>
<td>Karnataka</td>
<td>56.10 to 83.16</td>
<td>60.20 to 90.30</td>
<td>58.00 &amp; to 91.00</td>
<td>62.50 to 83.50</td>
</tr>
<tr>
<td>6</td>
<td>Madhya Pradesh</td>
<td>56.10 to 67.98</td>
<td>65.80 to 74.20</td>
<td>78.50 to 100.00</td>
<td>77.50 to 94.05</td>
</tr>
<tr>
<td>7</td>
<td>Maharashtra</td>
<td>56.10 to 85.80</td>
<td>59.50 to 96.60</td>
<td>56.00 @</td>
<td>60.00 to 96.60</td>
</tr>
<tr>
<td>8</td>
<td>Punjab</td>
<td>56.10 to 63.36</td>
<td>59.50 to 72.10</td>
<td>91.00 to 95.00</td>
<td>96.00 to 100.00</td>
</tr>
<tr>
<td>9</td>
<td>Tamil Nadu</td>
<td>56.10 to 69.96</td>
<td>59.50 to 76.30</td>
<td>52.70 to 74.54</td>
<td>59.50 to 87.93</td>
</tr>
<tr>
<td>10</td>
<td>Uttar Pradesh</td>
<td>56.10 to 68.64</td>
<td>59.50 to 74.20</td>
<td>85.00 to 90.00</td>
<td>90.00 to 95.00</td>
</tr>
</tbody>
</table>

* Linked to 8.5% recovery.
@ First advance of Rs.56.00 or SMP, whichever is more.
& SAP has been stayed by the High Court of Karnataka vide order dated 16.11.98 and has permitted individual factories to fix cane price in consultation with cane growers.
# As per Government information as on 31.1.2001.
TRENDS IN CANE PRICE (Per Metric Tonne)

Figure 4.05
advised price, the greater the power of cane growers lobby, the higher would be the State Advised Price. It is State intervention at the provincial level.

In case of National level price the Union Government has to balance the interest of cross sections of sugar industry. The specific pressure groups greatly influence the Governments at provincial level, more amenable and forced to respond to the demands of the cane growers. This trend to a great extent caused high price of sugarcane cultivation and manufacture of sugar.

Though the statutory minimum cane price is announced by the Government of India applicable throughout the country, the State Government announces a separate price known as State Advised Cane Price (SACP) which are normally higher than the Statutory Minimum Cane Price announced by the Central Government.

The State Government has been taking several steps by way of providing financial assistance to improve their working and performance. Yet another scheme is to provide financial assistance to societies so as to enable them to pay state advisory cane price. The scheme is intended to ensure payment of fair price to farmers i.e., sugarcane growers. The State Government has been advising the co-
operative sugar factories from time to time to pay state advisory cane price over and above the statutory minimum cane price fixed by the Government of India. Because the financial position of the co-operative sugar factories has been weak they could not pay the higher cane price. To solve this problem the State Government has been assisting the co-operative sugar factories by providing loans to pay the differential cane price, i.e., the difference of price between the statutory minimum cane price fixed by the Government of India and the State advisory cane price.

The Government of Andhra Pradesh State advised cane prices year-wise over the last 10 years and they are shown in Table 4.09 along with statutory minimum price.

The figures reveal that there is a large amount of difference in statutory minimum price and state advised price. For instance in the year 1991-92 the statutory minimum price was Rs.260 while the state advised price was Rs.295 per metric tonne showing a difference of Rs.35 per metric tonne higher of state advised price. Similarly the State advised price was higher by Rs.59.50 per metric tonne in 2000-01.
TABLE 4.09

STATEMENT SHOWING THE CANE PRICE PER M.T. IN ANDHRA PRADESH

(per Metric Ton)

<table>
<thead>
<tr>
<th>Year</th>
<th>S.M.P.</th>
<th>S.A.P.</th>
<th>Variations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991-92</td>
<td>260.00</td>
<td>295.00</td>
<td>(+) 35.00</td>
</tr>
<tr>
<td>1992-93</td>
<td>310.00</td>
<td>365.00</td>
<td>(+) 55.00</td>
</tr>
<tr>
<td>1993-94</td>
<td>345.00</td>
<td>400.00</td>
<td>(+) 55.00</td>
</tr>
<tr>
<td>1994-95</td>
<td>391.00</td>
<td>500.00</td>
<td>(+) 109.00</td>
</tr>
<tr>
<td>1995-96</td>
<td>425.00</td>
<td>534.00</td>
<td>(+) 109.00</td>
</tr>
<tr>
<td>1996-97</td>
<td>459.00</td>
<td>568.00</td>
<td>(+) 109.00</td>
</tr>
<tr>
<td>1997-98</td>
<td>484.00</td>
<td>610.00</td>
<td>(+) 126.00</td>
</tr>
<tr>
<td>1998-99</td>
<td>527.00</td>
<td>652.50</td>
<td>(+) 125.50</td>
</tr>
<tr>
<td>1999-2000</td>
<td>561.00</td>
<td>5% increase on last year's SAP paid by Factories</td>
<td></td>
</tr>
<tr>
<td>2000-2001</td>
<td>595.00</td>
<td>654.50</td>
<td>(+) 59.50</td>
</tr>
</tbody>
</table>

The minimum price payable to cane growers by the individual factory is fixed on the basis of recovery of the factory for the normal crushing period of the previous season.

The statutory minimum price and state advised price in case of sample units and their comparative figures are shown in Table 4.10.

Thus we may conclude that sugarcane price policy has not been consistent. There has been no steady policy in the matter of fixation of minimum sugarcane price. The only criterion which has been followed is that the prices have been invariably fixed to meet conditions prevailing in a year. So the conditions are not uniform. It is because of unrealistic sugarcane pricing policy adopted by the Government, there has been fluctuations in the area under sugarcane cultivation and production of sugar.

The new licensing policy states that the price of sugarcane will be decided on the basis of sucrose content, from the view point of encouraging improvement in the quality of cane.

**Purchase Tax**

Purchase tax is to be payable by every sugar factory to the Government as per the provisions of the Andhra Pradesh Sugarcane
# TABLE 4.10

**STATEMENT SHOWING S.M.P. AND S.A.P. IN CASE OF SAMPLE UNITS**

<table>
<thead>
<tr>
<th>Year</th>
<th>Chittoor</th>
<th></th>
<th>Tirupati</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S.M.P.</td>
<td>S.A.P.</td>
<td>S.M.P.</td>
<td>S.A.P.</td>
</tr>
<tr>
<td>1990-91</td>
<td>276.00</td>
<td>342.00</td>
<td>262.50</td>
<td>325.20</td>
</tr>
<tr>
<td>1991-92</td>
<td>296.70</td>
<td>336.20</td>
<td>296.70</td>
<td>336.60</td>
</tr>
<tr>
<td>1992-93</td>
<td>357.40</td>
<td>420.80</td>
<td>361.10</td>
<td>425.10</td>
</tr>
<tr>
<td>1993-94</td>
<td>389.60</td>
<td>451.80</td>
<td>389.60</td>
<td>451.80</td>
</tr>
<tr>
<td>1994-95</td>
<td>472.00</td>
<td>600.00</td>
<td>460.00</td>
<td>588.25</td>
</tr>
<tr>
<td>1995-96</td>
<td>495.20</td>
<td>615.70</td>
<td>473.60</td>
<td>590.50</td>
</tr>
<tr>
<td>1996-97</td>
<td>544.50</td>
<td>668.20</td>
<td>533.10</td>
<td>654.90</td>
</tr>
<tr>
<td>1997-98</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td>1998-99</td>
<td>558.00</td>
<td>710.50</td>
<td>527.00</td>
<td>667.40</td>
</tr>
<tr>
<td>1999-2000</td>
<td>640.20</td>
<td>731.80</td>
<td>613.80</td>
<td>687.40</td>
</tr>
<tr>
<td>2000-2001</td>
<td>644.00</td>
<td>731.80</td>
<td>637.00</td>
<td>700.70</td>
</tr>
<tr>
<td>2001-2002</td>
<td>693.50</td>
<td>753.50</td>
<td>722.70</td>
<td>782.70</td>
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</table>


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(Regulation of Supply and Purchase) Act, 1961 on the quality of cane purchased. At present, sugar units in Andhra Pradesh are required to pay purchase tax at the rate of Rs.16 per metric tonne of sugarcane purchased.

The avowed objective in imposition of purchase tax by the State Government is that the tax so collected would be utilized for the development of sugarcane roads and cane in the operational area of the factories.

The rate of tax varies and is being increased from time to time.

The purchase tax per metric tonne was Rs.10 in 1990-91. It was raised to Rs.16 per metric tonne that remained constant for three years from 1992 to 1994. The tax rate was Rs.22 per metric tonne during two years 1995 and 1996. The purchase tax was the highest of Rs.90 per metric tonne only in one year of 1996-97. Later in the year 1997-98 the tax amount was reduced to Rs.60 per metric tonne and the amount of tax has remained unchanged till the current crushing year 2001-02.

Table 4.11 shows year-wise purchase tax in Andhra Pradesh.
TABLE 4.11

STATEMENT SHOWING THE PURCHASE TAX PER M.T. IN ANDHRA PRADESH

<table>
<thead>
<tr>
<th>Year</th>
<th>Rate as per M.T.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990-91</td>
<td>10.00</td>
</tr>
<tr>
<td>1991-92</td>
<td>16.00 (from 10.1.1991)</td>
</tr>
<tr>
<td>1992-93</td>
<td>16.00</td>
</tr>
<tr>
<td>1993-94</td>
<td>16.00</td>
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<tr>
<td>1994-95</td>
<td>22.00</td>
</tr>
<tr>
<td>1995-96</td>
<td>22.00</td>
</tr>
<tr>
<td>1996-97</td>
<td>90.00 (from 10.1.1995)</td>
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<td>1997-98</td>
<td>60.00</td>
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<tr>
<td>1998-99</td>
<td>60.00</td>
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<tr>
<td>1999-2000</td>
<td>60.00</td>
</tr>
<tr>
<td>2000-2001</td>
<td>60.00</td>
</tr>
<tr>
<td>2001-2002</td>
<td>60.00</td>
</tr>
</tbody>
</table>

Under the Sugarcane Act, 1982 the sugar factories are required to pay a cess of Rs.14 per quintal with effect from 1.11.1982.

**Incentives for Cane Development**

Under Rule 17(i) of the Sugar Development Fund Rules, sugar undertakings are eligible for financial assistance for the following purposes:

(i) Setting up of heat treatment plants.
(ii) Rearing of seed nurseries
(iii) Incentives for switching over to improved varieties of sugarcane.
(iv) Pest control measures
(v) Irrigation schemes
(vi) Any other scheme or project as may be approved by the Central Government.

A separate fund is constituted known as cane development council fund. The fund is to be contributed by the cane growers and sugar factories. The fund is created primarily for the development of infrastructural facilities. At present, sugar factories and farmers are required to contribute at the rate of Rs.1 per metric tonne from each side.
Locational Factors

Sugar industry is an agro based industry like cotton textiles and it depends upon agriculture for its raw material. But the special feature of sugar industry, unlike cotton is the sugarcane is a weight loosing material as the sugar produced from cane ranges between 9 to 12 per cent of the total weight of the cane used. For the location of sugar factory, the guiding factor is transport. Quick transportation of cane is more important otherwise the sucrose content begins to deteriorate after it has been cut from the field. Within 24 hours after cutting, the cane should be crushed, otherwise the sucrose begins to get inverted as it does not form crystals of sugar. Therefore, sugar factories necessarily have to be located in the areas where sugarcane is grown in sufficient quantities.

To locate a factory enough supplies of fresh cane for crushing must be available in the immediate neighbourhood. Availability of transport facilities and cane availability in large and adequate quantities in immediate neighbourhood of the factories are the two important factors which guided the location of co-operative sector sugar factories. The units were located in different parts of the state adjacent to cane growing areas in their respective cane area zones.
Economics of Scale

Economics of scale in case of sugar industry is an important area to analyse to know certain aspects.

The sugar plants in India are mostly operating with 1250 tonnes of cane crushed per day (TCD). The analysis of installed capacity of existing units also reveals that there are some mills whose crushing capacity is 2500 or 3500 or even more TCD. According to the sugar technologists the ‘minimum efficient size’ is about 2500 TCD. A larger capacity of a plant would reduce the cost of production and the attainment of economies of scale. In the Sixth Plan the initial capacity of new sugar units was fixed at 1250 TCD. The Union Government announced the sugar licensing policy for the Seventh Plan under which the initial capacity of new sugar units was fixed at 2500 TCD. It was announced in December 1986. In April 1989 the Government of India reduced the minimum economic size of sugar plant to 1750 TCD.

The TCD was reduced from 2500 TCD to 1750 TCD on the basis of representation made by the members of the Parliament Congress (I) Party to the Prime Minister. The reason represented was that the policy would favour certain regions like U.P. and Maharashtra and put the states like Orissa and Bihar into inconvenience. The average Indian
sugar mill has a crushing capacity of only 1500 TCD. In Maharashtra it is 1822 TCD and in UP it is 1590 TCD. In Mauritius the average capacity is about 2200 TCD and in France it is about 7400 TCD.

Size

The Tariff Board 1938, considered 500 tonnes crushing per day as economical.

The committee constituted by the Government of India with the task of establishing standard specifications for sugar plant and machinery concluded that while for future the new plants be permitted with an initial capacity of 1500 tonnes crushing per day (TCD), all the existing new factories recently established at 1250 TCD be also reckoned at 1500 TCD because this level can be achieved with minor adjustments.

The Planning Commission constituted a working group in sugar industry in the year 1983 in order to formulate the targets and programmes for the sugar industry for the Seventh Plan period 1985-90.

The technical committee of 1983 was considered the task of revising the standard specifications for sugar plants and to examine the question of the economic size of a sugar plant i.e., whether it should remain as 1250 TCD or may be revised upward as 1500 TCD. However,
the technical committee recommended that the sugar plant to be installed in future should be of 1500 TCD as the economy of the scale was very much in favour of such capacity to commence with. It further, specified specifications for cane sugar plant of 1500 TCD capacity expandable to 2500 TCD capacity. The development council for sugar industry accepted in 1984.

The size of the sugar unit is one of the important factors to determine as to the economics of its establishment. The size of the sugar plants in co-operative sector in the State is measured with the help of installed crushing capacity in terms of tonnes per day.

With delicensing and the distance criterion of 15 kms, there will be underutilization of plant capacity, which will only add to the losses of the industry. All expert bodies like Gundu Rao Committee in 1963, Sen Commission in 1965, Tariff Commission in 1968 and 1974, Bhargava Commission in 1977 and RBI Study Group on ‘Sickness in Sugar Industry’ in 1986 recommended adequate minimum spatial distance between new and existing mills to avoid sickness in sugar industry. In fact the Bhargava Commission and RBI report had recommended spatial distance of 50 kms and 60 kms respectively.
The Screening Committee had been revived and reconstituted under the new policy vide Government of India's Office Memorandum, dated November 11, 1991. The minimum economic size of a new sugar factory to be set up during the Eighth Plan period was retained at 2500 TCD but permission was also granted to units with an initial capacity of 1750 TCD, provided that the units expand to 2500 TCD in five years' time. Out of 508 licensed sugar factories as on September 30, 1992, 298 are in co-operative sector, i.e., 58.66% and among 410 installed factories, co-operatives account for 229 units i.e., 55.85%. 

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