C H A P T E R   III.

CANE PRODUCTION, YIELD, AREA &
CAPACITY UTILISATION

3.1 Introduction:

In this Chapter, we examine correlation between:-
i) Cane Production and Capacity Utilisation,
ii) Area under Cane Cultivation & Capacity Utilisation,
iii) Per Hectare Cane Yield & Capacity Utilisation.

As stated in the previous Chapter, the relationship between cane production in the zone of the factory and the rates of capacity utilisation of the factory must be evidently positive, because if other things are equal, the rate cf capacity utilisation of the factory with larger cane production will be greater than the rate of capacity utilisation in the case of other factory with the smaller cane production in its zone.

Cane production depends, among a number of factors, mainly on the area under sugarcane cultivation. Therefore, larger area under cane cultivation will lead to a higher rate of capacity utilisation of a factory.

It is, however, important to note that given the area, the cane production will depend on the per hectare

yield of sugarcane which is determined by factors like soil quality, natural or man-made drainage facility, appropriate, adequate and timely application of organic and inorganic fertilisers, adequate and timely irrigation and proper supervision by the farmer, etc. We, therefore, considered it very appropirate to exam-ine the correlation between yield per hectare and the rate of capacity utilisation of a factory.

3.2 A Brief Profile of the Sugar Factories Under Study (Table no. 3.1 gives vital information regarding the co-operative sugar factories uncer study. For the present study, we have concentrated on the data for the period of 5 years,that is, 1981-82 to 1985-86. This period constitutes recent latest period which in a way avoids the initial problems which a co-operative sugar factory generally faces immediately after its establishment. It is seen that all the factories under consid eration have completed more than 5 crushing seasons. The Shahu Co-operative Factory, Kagal, is the factory with minimum crushing season(s) included in this study whereas Bhogawati, Panchaganga and Warana are the Factories with a considerable larger number of crushing seasons.

Another point to be noted is that the sample co-operative sugar factories belong to different parts and talukas of Kolhapur district and as such, the sample is adquately representative of diverse geo-climatic conditions of the District.

GENERAL PROFILE OF FACTORIES UNDER STUDY

Sr. no.	Factory	Establi-shed on	Produc-tion commen--ed on	Initial Crushing Capacity (M.Tons)	Present Crushing Capacity (M.Tons)	Cane Crushed during First Year (M.Tons)	Cane Crushed during 1985-86 (M.Tons)
1.	Deulat Shetkari Sahakari Sakhar Karkhana Limited A/P HALKARNI, Tal.Chandgad	30.1.70	3.11.77	1,250	1250	1,62,881.42	2,31,324.10
2.	Gadhinglaj Taluka Sahakari Sakhar Karkhana Limited, A/P GADHINGLAJ, Tal.Gadhinglaj.	12.2.74	21.11.79	1,250	1,250	1,20,251.00	2,03,901.00
3.	Shree Chhatrapati Shahu Sahakari Sakhar Karkhana Limited, A/P KAGAL, Tal.Kagal	21.2.77	30.11.80	1,250	1,250	78,513.59	1,58,097.00
4.	Shree Datta Shetkari Sahakari Sakhar Karkhana Limited, A/P SHIROL, Tal.Shirol.	9.6.69	16.3.72	1,250	2,000	1,38,387.00	3,69,264.00
5.	Bhogawati Sahakari Sakhar Karkhana Limited, A/P SHAHUNAGAR-PARITE, Tal.Radhanagari	11.10.55	1958-59	2,000	2,000	93,939.95	4,33,386.00
6.	Shree Dudhganga-Vedganga Sahakari Sakhar Karkhana Limited, A/P BIDRI-MOUNINAGAR	10.10.56	14.3.63	1,250	3,500	1,11,830.00	2,15,514.00
7.	Shree Panchaganga Sahakari Sakhar Karkhana Ltd., A/P GANGANAGAR, ICHALKARANJI, Tal.Hatkanangale.	1.10.55	1958-59	1,250	5,000	86,425.70	7,78,755.00
8.	Kumbhi-Kasari Sahakari Sakhar Karkhana Limited, A/P KUDITRE Tal.Karveer.	1960	1963-64	1,250	3,000	86,425.90	4,44,395.00
9.	Shree Warana Sahakari Sakhar Karkhana Limited, A/P WARANANAGAR, Tal.Panhala.	27.8.55	1959	1,016	3,000	66,843.00	4,24,624.00

3.3 Correlation between Cane Production & the Rate of Capacity Utilisation:

We first examine the correlation between cane production and the rate of capacity utilisation for the factories under study. In Appendix 3.A of this Chapter, we have given five years data regarding cane production of each of the factory under study. Similarly, in Appendix 3.B, we have given the rate of capacity utilisation of each factory for all the years under study.

As explained earlier, by using the formula, we have obtained the following values of correlation between cane production and the rate of capacity utilisation for the factories under study.

TABLE No.3.2

CO-EFFICIENT OF CORRELATION

Cane Production & Capacity Utilisation

(1981-82 to 1985-86)

Sr. no.	Name of the Factory	'r' Value
1.	Daulat	0.94
2.	Gadhinglaj	0.94
3.	Shahu	0.43
4.	Datta	0.46
5.	Bhogawati	-0.39
6.	Dudhaganga	N.A
7.	Panchaganga	0.99
8.	Kumbhi-Kasari	0.87
9.	Warana	0.61

It is clearly seen from the above Table that in the case of Sugar Factories Daulat, Gadhinglaj, Panchaganga and Kumbhi, the 'r' value is more than 0.80, indicating a strong positive correlation between cane production and the rate of capacity utilisation. In the case of Shahu, Datta and Warana, again the 'r' values are positive but weaker. In the case of Dudhaganga factory, we could not get cane production figures under study. Surprisingly, in the case of Bhogawati factory, the 'r' value is negative though weak.

If we carry out an exercise in an aggregate manner, i.e. if we put together cane production of all the factories for each of the years under study and correlate them with the aggregate rate of capacity utilisation of all the facteries in the aggregate sense also, the correlation between cane production and the rate of capacity utilisation is positive and fairly strong.

If we look at the basic data given in Appendix A, it is seen that in the case of Bhogawati factory, there has been a kind of inverse relationship between increasing cane production and the rate of capacity utilisation beginning from the year 1983-84 to the year 1985-86, particularly when we see that in the year 1981-82 with the lowest cane production, we have a higher capacity utilisation rate compared with the years 1983-84 to 1985-86. This can be explained perhaps on the basis of excessive incidence of stoppages and other managerial deficiencies.

3.4 Cross Sectional Approach:

If we carry out cross sectional exercise to find out the correlation co-efficient, i.e. the relationship between cane production and the rate of capacity utilisation in respect of different sugar factories sfor the same year, we get the following results:

TABLE NO.3.3
CROSS SECTIONAL 'r' VALUES
(Eight Factories)

Sr. no.	Years	'r' Values
1.	1981-82	+0.03
2.	1982-83	-0.23
3.	1983-84	+0.42
4.	1984-85	+0.08
5.	1985-86	+0.33

It is seen that except for the year 1982-83, the 'r' values are positive but very weak. It is only for the year 1983-84 when the 'r' value is both positive and fairly strong.

3.5 Correlation between Area under Sugarcane Cultiva-
-tion & the Rate of Capacity Utilisation:

Following are the 'r' values for the relationship between the area under sugarcane cultivation and the rate of capacity utilisation in the zones of the respective factories for the years 1981-82 to 1985-86.

TABLE NO.3.4

CO-EFFICIENT OF CORRELATION

Area under Sugarcane & Capacity Utilisation

(1981-82 to 1985-86)

Sr. no.	Name of the Factory	'r' Values
1.	Daulat	+0.35
2.	Gadhinglaj	+0.10
3.	Shahu	-0.01
4.	Datta	+0.91
5.	Bhogawati	-0.41
6.	Dudhaganga	N.A
7.	Panchaganga	+0.38
8.	Kumbhi-Kasari	+0.92
9.	Warana	+0.21

On the basis of Table no.3.4, it is seen that in the case of Shahu Co-operative Factory, Kagal, and Bhogawati Co-operative Factory, Parite, the 'r' values are negative. However, in the case of Shahu Factory, the 'r' value is negative but extremely weak, whereas in the case of Bhogawati Factory, it is negative but fairly strong. This may be due to any or all of the following factors - greater frequency of stoppages, increasing inefficiency of management, recurrent labour problems and more probably greater diversion of zonal cane to other nearby factories because of relatively higher prices paid by other factories. Another possible reason of this may be delayed switching over by this factory from old system to modern system of sugar making. In the case of

Factory, Kagal, the very weak negative value of 'r' may be attributable to the fact that it has been started only one year earlier before the first year of the study.

If we carry out an exercise in an aggregate manner, i.e. if we put together cane area of all the factories for each of the years under study and correlate them with the aggregate rate of capacity utilisation of all the factories for the respective years, we get the 'r' value 0.51. In other words, in the aggregate sense also, the correlation between cane area and the rate of capacity utilisation is positive and fairly strong.

3.6 Cross Sectional Approach:

If we carry out cross sectional exercise to find out correlation co-efficient, i.e. relationship between area under cane and the rate of capacity utilisation in respect of different sugar factories for the same year, we get the following results:-

TABLE NO.3.5

CROSS SECTIONAL 'r' VALUES

Sr. no.	Years	'r' Values
1.	1981-82	-0.10
2.	1982-83	-0.48
3.	1983-84	-0.02
4.	1984-85	+0.19
5.	1985-86	+0.07

So far as 'r' values regarding relationship between area and rate of capacity utilisation are considered cross-sectionally, it is seen that for the first three years, 1981-82 to 1983-84, they are negative though weak but for the year 1982-83, relatively much stronger. In the last two years, the 'r' values are positive but again not very strong. On the whole, it can be said that the area under sugarcane as a single factor cannot be considered as of great significance. This also appears logically correct because the cane production will be more correlated positively with yield per hectare rather than with area under sugarcane. It is quite possible that a smaller area with more appropriate fertility for sugarcane will give greater sugarcane production than a larger area which is less suitable for cane cultivation. It, therefore, becomes of great significance to examine the relationship between yield per hectare and the rate of capacity utilisation.

3.7 Correlation between Yield per Hectare & the rate of Capacity Utilisation:

Following are the 'r' values for the relationship between yield per hectare and the rate of capacity utilisation.

TABLE NO.3.6

CO-EFFICIENT OF CORRELATION BETWEEN YIELD PER HECTARE
& RATE OF CAPACITY UTILISATION

Sr. no.	Name of the Factory	'r' Value
1.	Daulat	N.A
2.	Gadhinglaj	-0.08
3.	Shahu	+0.61
4.	Datta	-0.05
5.	Bhogawati	+0.94
6.	Dudhaganga	+0.88
7.	Panchaganga	+0.69
8.	Kumbhi-Kasari	+0.81
9.	Warana	+0.46

On the basis of this Table, it can be said that excepting Gadhinglaj and Datta Sugar Factories, the 'r' values for the remaining factories for the relation between yield per hectare and the rate of capacity utilisation are positive and fairly strong.

Moreover, if we take into consideration the co-efficient of correlation in an aggregate sense as explained earlier, we get a very fairly strong and positive 'r' value, which certainly shows that yield per hectare of the year is more important than the area factor in determining the rate of capacity utilisation.

3.8 Cross Sectional Approach:

If we carry out cross sectional exercise to find out the correlation between yield per hectare and the rate of capacity utilisation in respect of different sugar factories for the same year, w get the following results:-

TABLE NO.3.7

CROSS SECTIONAL 'r' VALUES

Sr. no.	Years	'r' Values
1.	1981-82	0.13
2.	1982-83	0.62
3.	1983-84	0.07
4.	1984-85	0.58
5.	1985-86	0.14

If we consider the 'r' values based on analysis of cross sectional data, it is seen that 'r' values for all the years under study are positive and fairly strong in the years 1982-83 and 1984-85. Considering that in all the three cases, i.e. 'r' values overtime for each factory, 'r' values overtime in aggregate and cross sectional 'r' values indicate a fairly strong positive relationship between the yield per hectare and the rate of capacity utilisation, we can certainly say that an increasing yield per hectare will generally tend to increase the rate of capacity utilisation and the strength of this effect may be reduced to some extent by factors like stoppages, labour unrest and managerial inefficiency.

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FACTORY-WISE CANE PRODUCTION, CANE AREA & YIELD PER HECTARE
(1981-82 to 1985-86)

Year	Factors	Daulat	Gadhing-laj.	Shahu	Datta	Bhoga-wati	Dudha-ganga	Pancha-ganga	Kumbhi-Kasari	Warana
1981-82	a. Cane Production	3,21,600	3,10,974	75,372	1,51,300	7,34,065	NA.	15,68,000	5,28,000	4,56,544
	b. Cane Area	4,800	3,230	1,142	5,829	7,727	NA.	19,602	6,680	6,198
	c. Yield Per Hectare	N.A.	58.00	68.00	72.35	81.57	56.65	80.50	79.02	76.36
1982-83	a. Cane Production	3,36,000	3,10,210	1,02,840	10,87,900	7,50,785	NA.	15,85,000	6,00,000	4,08,404
	b. Cane Area	4,800	3,695	1,714	6,554	7,903	NA.	20,044	6,850	6,576
	c. Yield Per Hectare	NA.	53.00	62.00	68.03	93.70	57.30	79.02	87.80	79.79
1983-84	a. Cane Production	1,99,325	1,68,867	53,984	11,00,000	7,54,155	NA.	13,35,000	4,43,000	3,95,829
	b. Cane Area	4,556	3,335	1,418	5,520	8,149	NA.	19,639	6,915	7,000
	c. Yield Per Hectare	NA.	38.00	48.00	64.24	74.46	37.00	68.47	64.55	61.69
1984-85	a. Cane Production	2,55,000	2,82,040	98,224	10,00,000	7,92,680	NA.	14,30,000	5,41,576	3,94,021
	b. Cane Area	4,214	3,719	1,754	4,868	8,344	NA.	18,140	7,126	6,000
	c. Yield per Hectare	NA.	50.00	60.00	72.25	80.64	46.70	79.26	76.44	74.32
1985-86	a. Cane Production	2,40,983	2,28,253	89,090	11,00,000	8,13,675	NA.	13,33,000	5,33,111	2,94,259
	b. Cane Area	4,309	3,592	1,510	4,880	8,565	NA.	18,863	7,324	5,443
	c. Yield Per Hectare	NA.	96.00	61.00	72.78	76.20	42.83	79.04	68.37	68.60

Cane Production in M.Tonnes
Cane Area in Hectares
Yield per Hectare in M.Tonnes

APPENDIX 3-B

CAPACITY UTILISATION OF FACTORIES UNDER STUDY

(1981-82 to 1985-86)

Sr. no.	FACTORY	1981-82	1982-83	1983-84	1984-85	1985-86
1.	Daulat, Halkarni.	135	139	78	113	116
2.	Gadhinglaj, Gadhinglaj.	144	151	89	117	102
3.	Shree Shahu, Kagal.	118	136	76	84	79
4.	Shree Datta Shirol.	132	148	111	107	115
5.	Bhogawati, Parite.	140	159	119	134	135
6.	Dudhganga Bidri.	76	75	46	44	38
7.	Panchaganga, Ichalkaranji.	121	123	89	105	94
8.	Kumbhi-Kasari, Kuditre.	78	137	73	96	93
9.	Warana, Warananagar	121	130	86	92	88
	Average Capacity Utilisation	118.33	133.11	85.22	99.11	95.56